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AGRICULTURE AS A CONSTRAINT IN DEVELOPMENT IN THE 1980S: THE PROBLEMS OF FOOD DEFICIT COUNTRIES*

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CONTENTS

		Page
Introduction		1
I.	Identification of major food deficit countries and some of their development problems	2
	1. Agriculture as a constraint in development of the selected countries	4
	2. Special role of the food sub-sector	5
	3. Performance of the agricultural sector in the selected countries	6
	4. Performance of the foodgrains sub-sector	8
	5. Performance of the cereals sub-sector	12
	6. Statistical evidence on "food deficits" and nature and causes of such deficits	12
	7. Some implications of structural inequalities of distribution of income and wealth	22
	8. The supply side	23
	9. Employment effects	25
	10. Impact of government policies	28
	11. The demand side	29
	12. Empirical evidence on the degree of growth linkages between agricultural and industrial sectors	30
II.	The magnitude of "food deficits" in selected countries in the 1980s and tasks ahead	33
	1. The projected "food deficits" by the Second Asian Agricultural Survey	33
	2. The IFPRI's projections	35
	3. FAO's projections	35
	4. Tasks ahead	39
	5. The "potential performance" gap	39
	6. The recent crop outlook and prospects for 1980s	40
	7. The development needs and required tasks	40
III.	Development strategies for the 1980s	41
	1. Structural reforms	42
	2. Complementary economic policies	45
IV.	Some concluding observations	50
Appendix:	Statistical tables	52-75

INTRODUCTION

As in the past two to three decades, the development of the agricultural sector would continue in the 1980s to be a crucial determinant of the success of planned economic development aimed at economic growth with social justice among most of the developing countries of the ESCAP region in view of their dominantly agricultural economies. Most of these countries have experienced slower rates of economic growth in the past due to slow and uneven rates of growth of agricultural output which have constrained the availabilities of foodgrains and other agro-based wage goods and industrial raw materials required in the domestic economy as well as for exports. In most such countries, the slower rates of growth of agricultural output have impaired the capacity of the agricultural sector to generate additional employment to alleviate the problem of increasing unemployment and underemployment due to the pressure of the growth of the population. Many of these countries have also experienced widespread poverty and growing inequalities of income and productive assets especially in the rural areas which have constrained the size of the market for agricultural products (including food) as well as industrial products.

One clear manifestation of the above mentioned pattern of development has been somewhat persistent and often sizeable food deficits experienced by some of the developing countries of the ESCAP region in recent years. The purpose of this paper is to identify this sub-set of the countries of this region and to examine the problems and prospects of their development in the United Nations Second Decade of Development (1980s) and to evolve a framework for suitable strategies for accelerating the pace of development of their economies.

This paper is, therefore, divided into four sections. Section I deals with the identification of the major "food deficit" countries of the ESCAP region and the degree of the "deficit" in the past and its likely magnitude in the next one or two decades. It also looks at the several (often interrelated) problems faced by these countries in their quest for economic growth with social justice which are accentuated by the developments in the agricultural sector specially in the sub-sector of foodgrains. It also examines the pattern of economic development of these countries including intersectoral linkages between the agricultural and the industrial sectors

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and seeks answers to the twin questions of the relative deceleration in the rates of economic growth experienced by most of these countries in more recent years and the insignificant (or even negative) progress recorded in reducing the poverty of the masses specially in the rural areas in two decades (or more) of planned economic growth. Section II provides an analysis of the magnitude of the "food deficits" of the selected countries in the 1980s (and in some cases at the terminal year 2000) and spells out the tasks ahead of these countries keeping in mind the most recent performance on the front of food production. Section III presents a framework for the development strategies to achieve the tasks identified in the earlier section. And Section IV contains some concluding observations on the subject matter of this paper.

I. IDENTIFICATION OF MAJOR FOOD DEFICIT COUNTRIES AND SOME OF THEIR DEVELOPMENT PROBLEMS

This study has identified the following five major countries of this region which have been experiencing food "deficits" with varying degrees of deficits over the last two decades: (1) Bangladesh, (2) India, (3) Indonesia, (4) Pakistan, and (5) Sri Lanka. These countries have been classified as "food deficit" countries (as will be shown a little later in this section) not merely looking at the imbalance between demand and supply of foodgrains as reflected in market place in terms of "high" foodgrain prices but also in terms of the shortfall from the normative requirements of minimum diet as specified by the Food and Agricultural Organization of the United Nations.

There are several problems faced by the above mentioned five food deficit developing countries which vary from country to country depending on differences in their economic structure, government policies and specific local conditions. Thus as revealed by the key economic indicators collected by the Asian Development Bank, we have among this group of five countries, a country like India with an estimated population as high as 638.39 million in 1978 (which makes it the second largest populated country in the world) and on the lower side of population a country like Sri Lanka with a corresponding population of 14.15 million. The density of population as judged by persons per square kilometer within these countries varies from a high of 592 for Bangladesh to a low of 74 for Indonesia. Considering the period 1974 to 1978, the estimated annual rate of growth of population on the lower

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side was recorded by Sri Lanka at 1.6 per cent and on the higher side by Pakistan at 3.0 per cent. The estimated per capita income in 1977 varied among these countries from a low of $US 90 for Bangladesh to a high of $US 300 for Indonesia. The annual average rate of growth of real Gross Domestic Product for the period 1969-1977 excluding Bangladesh roughly varied from a low of 3.8 per cent (for India and Sri Lanka) to a high of 8.0 per cent (Indonesia). The share of agriculture in GDP in 1977 roughly speaking was estimated on the lower side at 32.0 per cent for Sri Lanka and on the higher side at 52.1 per cent for Bangladesh. On the other hand, the share of manufacturing in GDP in 1977 approximately ranged from a high of 22.0 per cent for India to a low of 11.1 per cent for Bangladesh. These numbers are illustrative of the differences in the degree of economic development of the selected five food deficit developing countries.

Even on the food situation, there are certain differences which are of recent origin but are likely to affect the food scenario in the coming years. Thus, in the 1960s and 1970s it was considered more or less certain that Pakistan would achieve food "self-sufficiency" (in terms of the balance between supply and demand in the market place) if not emerge as a food surplus economy. The events of past few years seem to belie this hope. The case of India now appears just to be reverse. Despite these apparently changing market conditions, some of the food deficit countries identified by us, there are enough common problems faced by most of these countries which justify the undertaking of this study.

We have, therefore, attempted in this paper to look at relatively common problems faced by most of these countries and to examine their implications for development strategies in the 1980s. Within this broad framework, special emphasis is placed on the Indian case partly because numerically, the largest number of rural poor among the selected countries undoubtedly live here and India's experiences in promoting growth with social justice illustrate the difficulties which are likely to be faced by the other selected countries adopting largely similar approaches and partly because the author of this paper is more familiar with the Indian conditions and believes that the Indian experience does throw up some very relevant issues for the policy makers of the other selected countries. It, therefore, needs to be stated here at the outset that some of the conclusions of this paper need to be re-examined if the conditions in another country are very different from the Indian case.

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1. Agriculture as a constraint in development of the selected countries

In view of the dominantly agricultural character of the five "food deficit" countries listed above, the performance of the agricultural sector substantially influences the over-all economic performance of these countries.[1/] A slowing down of the rate of growth of agricultural production has often led to the slowing down of the rate of growth of the Gross National Product in most of the countries selected for this study. The process of economic development makes several demands on the agricultural sector in four major fields - for the required supplies of foodgrains and of industrial raw materials, generation of foreign exchange through exports and finally creation of more employment opportunities. Some of the countries (in our case Sri Lanka especially as may be seen from table A-18 in the appendix) depend on a major way on agricultural (or agro-based) exports to generate foreign exchange for required imports in a situation of continuing balance of payments deficits on current accounts. In such situations, development of the industrial sector is clearly constrained by the availabilities of surpluses of food and raw materials from the agricultural sector and ultimately by the size of the market for industrial goods in the rural areas. Furthermore, the price level situation in these countries also quickly responds to the fluctuations in agricultural output. Most of the countries selected for our study are characterized by high levels of unemployment and underemployment in rural areas and migration of labour from the rural areas to the urban areas worsens the already acute unemployment situation in the urban areas which can have explosive socio-economic implications. In view of the dominance of the agricultural sector, this sector sets clear limits on the process of mobilization of resources through domestic savings for channelization into productive investment. The fluctuations in agricultural output due to the vagaries of

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1/ The bulk of labour force in these countries is still employed in the agricultural sector. Even though agriculture's share in total labour force has been falling over time for most of the selected countries (as may be seen from table A-8 in the appendix), it was 50 per cent in 1975 for Sri Lanka (on the low side) and 72 per cent for India on the high side. Similarly, while the share of "agriculture" (including forestry and fisheries for some countries) in Gross Domestic Product (GDP) has been declining in most countries over time, in 1976, it was estimated at 59 per cent, 49 per cent, 32 per cent and 37 per cent for Bangladesh, India, Pakistan and Sri Lanka (World Bank, World Development Report 1978). The key indicators collected by the Asian Development Bank showed this share to be 36.1 per cent for Indonesia.

the nature often add to the problems of these countries. The behaviour of the agricultural sector thus becomes a crucial factor determining the macro-economic policy options available to the Government.

2. Special role of the food sub-sector

Within the agricultural sector, the food sub-sector assumes a very special place in the economies of the five selected countries. In most of these countries, the foodgrains sector happens to be the backbone of the agricultural sector both in terms of its contribution to the value-added and contribution to the share of consumer expenditure of the vast majority of poor people. Foodgrains are the most important "wage goods" which constrain the generation of new employment opportunities both in the rural and much more so in the urban areas in the industries. "Food deficits" in the market sense with the given distribution of income and wealth often lead to inflation or accentuate the inflationary process through the "cost push" mechanism of this basic wage good. With the inequitable distribution of income, wealth and economic opportunities, malnutrition is fairly common in most rural areas of these countries. The very poor lack even the purchasing power to buy this basic necessity (foodgrains). It is now known that increased food expenditure by the presently undernourished persons along with expenditure on certain other basic needs can increase their productivity as a participant in the labour force and thus contribute to the acceleration of economic growth of these countries.[2/] Moreover, in view of very clear limits on the possibilities of continuing large scale imports of foodgrains by any country in the existing world market for foodgrains and also considering the capacity constraints of the food-deficit countries for such imports, foodgrains have acquired strategic importance for national security. Most food deficit countries of the Asian region have, therefore, set for themselves the achievement of the goal of self-sufficiency in foodgrains within a short period of time in "future". In view of the overwhelming importance of the foodgrains sub-sector of agriculture, this sub-sector has become synonymous with the constraints in the development imposed by agriculture as enumerated in the

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2/ Cf. International Labour Office, Poverty and Landlessness in Rural Asia (Geneva, 1977), p.30.

above sub-section.[3/]

3. Performance of the agricultural sector in the selected countries

Table A-1 in the Appendix presents the Index Numbers of Agricultural Production of the five countries selected by us. A look at this table would reveal that the growth rate of agricultural output has been uneven and on the whole relatively slow during the 1970s (upto now). Despite the impetus provided by the spread of "Green Revolution" in most of these countries after mid-1960s, a plateau appears to have been reached in agricultural production in the 1970s compared to the situation prevailing in the years 1969-1971 in most of these countries. By the end of 1977, the production index for Bangladesh, India and Pakistan was below the 1969-1971 base year. To some extent, it reflects the bad weather conditions prevailing in most of Asia during 1972 to 1974. However, there appears to be little doubt about the deceleration in the average annual trend rate of growth of agriculture in the period 1970-1976 compared to the decade 1960-1970 in the case of Bangladesh, India, Pakistan as well as Sri Lanka. The rates of growth of GDP were also relatively low for these four countries. This is borne out by table 1.

The performance of agriculture of the last mentioned four countries for comparable periods is much below the performance of some other Asian countries who experienced high rates of growth of Gross Domestic Product.[4/] Thus, the Republic of Korea recorded annual trend rate of growth of GDP at 8.5 per cent and 10.3 per cent during 1960-1970 and 1970-1976 with corresponding rates of growth of agriculture as 4.5 per cent and 4.8 per cent respectively. The Republic of China witnessed 9.2 per cent and 7.8 per cent rates of growth of GDP and 3.4 per cent and 1.5 per cent rates of growth of agriculture in corresponding periods. Malaysian rates of growth of GDP were 6.5 per cent

/Table 1.

3/ A crude exercise at correlating the time series of index numbers of agricultural production and index numbers of food production with each other and with the series of the index numbers of real Gross Domestic Product and Consumer Prices as well as with the series on the imports of foodgrains for the period 1963 to 1975 based on the United Nations data confirms the existence of relatively high degrees of correlation Coefficients (mostly around 0.8 to 0.9) for selected pairs of variables for India, Indonesia, Pakistan and Sri Lanka as hypothesized in the last two paragraphs. The exercise is admittedly crude as most of the variables selected here as a trend have been consistently increasing in value over time reflecting growth of the over-all economy.

4/ World Bank, World Development Report 1978, August 1978.

Table 1. Rates of growth of population, gross domestic product and agricultural production in selected ESCAP countries 1960 to 1976
(per cent per annum)[a/]

Country	Population		GDP		Agriculture[b/]	
	1960-1970	1970-1976	1960-1970	1970-1976	1960-1970	1970-1976
1. Bangladesh	2.8	2.0	3.6	1.6	2.7	0.5
2. India	2.3	2.1	3.6	2.7	1.9	1.4
3. Indonesia	2.2	2.4	3.5	8.3	2.7	4.0
4. Pakistan	2.8	3.0	6.7	3.6	4.9	1.6
5. Sri Lanka	2.4	1.7	4.6	2.9	3.0	1.2

Source: World Bank, World Development Report 1978: August 1978.

Notes: a/ Compound growth rate, estimated by least squares trend fitting.
b/ Comprises agriculture, forestry, hunting and fishing.

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and 7.8 per cent and of agriculture at 6.8 per cent and 6.4 per cent in corresponding periods. Thailand's comparable rates were 8.2 per cent and 6.5 per cent for GDP and 5.5 per cent and 4.3 per cent for agriculture. Similar rates for the Philippines were 5.1 per cent and 6.3 per cent for GDP and 4.3 per cent and 4.6 per cent for agriculture for the corresponding periods (1960-1970 and 1970-1976).

What is worse, the rates of growth of agriculture recorded in the five countries selected by us were not much above the rates of growth of population (and were in fact negative for some years for some countries). Thus per capita agricultural output did not grow much. This is also revealed by the data provided in table 1 and much more clearly in table 2. Thus, for example, for the period 1970 to 1976, India, Indonesia and Pakistan recorded negative rates of growth of per capita agricultural production while the comparable rate of growths were well below 1 per cent for the remaining two countries.

Thus, the recent (1960-1976) performance of agriculture has not been very satisfactory among the countries selected by us.

4. Performance of the foodgrains sub-sector

Recognising the importance of the foodgrains sub-sector in the economies of the selected five countries as outlined above which is further supported by the importance of foodgrains as the single most important item of consumer expenditure in rural areas of countries selected by us (as shown in tables A-5.1 to A.5.5), we now turn to the review of the performance of this sub-sector.

The performance of Asian agriculture, in general, and the foodgrains sector in particular, has been recently undertaken in a masterly survey (called the Second Asian Agricultural Survey) under the auspices of the Asian Development Bank. Most of the facts relating to the performance of the "food deficit" countries of this region have been lucidly documented in this Survey.[5/] Most of these facts are further borne out by the more

/Table 2.

5/ Asian Development Bank, Rural Asia: Challenge and Opportunity (New York, Praeger), 1977.

Table 2. Rates of growth of agricultural production in relation to population, 1961-1965 to 1970 and 1970-1976

Region/ country	Total population		Agricultural production			
			Total		Per capita	
	1961-1965 to 1970	1970-1976	1961-1965 to 1970	1970-1976	1961-1965 to 1970	1970-1976
Far East	2.5	2.5	3.3	2.6	0.8	0.1
Bangladesh	2.9	1.7	2.9	1.9	-	0.2
India	2.4	2.5	3.0	2.1	0.6	-0.4
Indonesia	2.6	2.6	3.7	3.3	1.1	0.6
Pakistan	2.8	3.2	6.0	2.0	3.1	-1.1
Sri Lanka	2.4	2.2	2.2	0.3	-0.1	-1.8

Source: FAO: World Food Survey, 1977 (table 1.2.1 and appendix A).

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recent data published by the Food and Agricultural Organization of the United Nations, particularly in its Fourth World Food Survey 1977.[6/] We can do no better than highlight some of the findings of these two major Surveys of the food situation in the countries selected for this study.

Table 3 presents the average annual rates of growth of food production and compares them to the rates of growth of population for the Far East as well as for the countries selected in this study. It is quite clear from this table that the growth of food production has barely kept pace with the growth of population (the difference between their annual rates of growth being less than 1 per cent) in these countries (for example, for Bangladesh for the period 1961-1965 to 1970 and 1970-1976; for India for similar periods; for Pakistan for the period 1970-1976; and for Sri Lanka for the period 1970-1976), and in some of them, the growth rate of per capita cereal production has actually fallen over time and in fact turned negative in some cases (for example, for Bangladesh for the period 1961-1965 to 1970; for India for the period 1970-1976; for Pakistan for the period 1970-1976; and for Sri Lanka for 1970-1976).

It should also be noted that there are other countries among our group of countries like India and Pakistan (considering the period 1952 to 1972) where, though foodgrains production has kept pace with population growth, it fell short of the quantities indicated by the effective demand as demonstrated by the results of the exercise carried out in the Second Asian Agricultural Survey.

/Table 3.

6/ FAO, The Fourth World Food Survey 1977 (Rome, 1977).

Table 3. Average annual rates of growth of food production in relation to population: 1961-1965 to 1970 and 1970 to 1976

Region	Population		Food production			
			Total		Per capita	
	1961-1970	1970-1976	1961-1970	1971-1976	1961-1970	1970-1976
Far East	2.5	2.5	3.5	2.8	0.9	0.2
Bangladesh	2.9	1.7	3.0	2.4	0.2	0.7
India	2.5	2.5	3.2	2.1	-0.8	0.4
Indonesia	2.6	2.6	3.8	3.7	1.2	1.0
Pakistan	2.8	3.2	6.2	2.9	3.2	-0.2
Sri Lanka	2.4	2.2	3.8	2.2	1.4	-

Source: Food and Agriculture Organization, World Food Survey, 1977 (Table 1.1.1 and Appendix B).

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5. Performance of the cereals sub-sector

Food consumption patterns have not changed much in most of the Asian countries, especially in the five countries selected for our study. Within the food category, consumer expenditure in rural areas indicates dominance of expentiture on the cereals (40 per cent or more in most countries as shown in tables A-5.1 to A-5.5). These are the major source of calories in the diet of the typical Asian. Rice and wheat are the major cereals claiming a major portion of such expenditure for all expenditures classes of consumers in the five countries being studied, while some coarse grains (like jowar, bajra, etc.) are also important cereals in the consumption expenditure of the poorer classes in India and Pakistan.

Average annual rates of growth of cereal production and of population are given in table 4. The pattern depicted here is similar to the one shown in table 3. During the recent years, 1970-1976, the rates of growth of per capita cereal production were meagre and per capita production actually declined in India, Pakistan and Sri Lanka.

6. Statistical evidence on "food deficits" and nature and causes of such deficits

a. The evidence based on "market deficit" criterion

The trends in the production of cereals summarized above invariably led to the experience of "food deficits" in the market place, i.e. market demand outstripped supplies from domestic production at several points of time in the 1960s and 1970s in the five countries being studied by us. These countries were, therefore, forced to augment availability of cereals by imports, often massive in terms of the import bill. Table A-3 in the appendix presents data on the imports of cereals as percentage of total domestic production of cereals for Asia as well as for the five countries being studied. These ratios have been in the range of 1 per cent to 12 per cent for most of the countries in any single year. In the case of Sri Lanka, this ratio has been exceptionally high often being above 60 per cent. Table A-4 in the appendix confirms that the trend rates of growth of imports (especially in value terms) have been highly significant statistically (at 1 per cent value of significance) for Asia as a region as well as for all the five countries being studied by us. This is one of the criterion used by us in labelling these five countries as the major "food deficit" countries of this region.

/Table 4.

Table 4. Average annual rates of growth of cereal production in relation to population: 1961-1965 to 1970 and 1970 to 1976

Region/ country	Population		Cereal production			
			Total		Per capita	
	1961-1965 to 1970	1970 to 1976	1961-1965 to 1970	1970 to 1976	1961-1965 to 1970	1970 to 1976
Far East	2.5	2.5	4.2	2.5	1.6	0.0
Bangladesh	2.9	1.7	2.6	3.1	-0.3	1.4
India	2.4	2.5	4.3	2.1	1.9	-0.4
Indonesia	2.6	2.6	6.0	3.0	3.3	0.4
Pakistan	2.8	3.2	9.1	3.1	6.3	-0.1
Sri Lanka	2.4	2.2	7.8	-2.9	5.3	-5.0

Source: FAO: World Food Survey, 1977 (table 1.1.2 and appendix B).

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The existence of significant trends in the growth of imports of cereals among the five selected countries of Asia shows that the governments of most of these countries have been chasing the elusive goal of national self-sufficiency in foodgrains in recent years. Considering the fact that most of these countries have been facing balance of payments deficits which constrain their ability to import foodgrains, one can question whether these countries have imported enough cereals (and other foodgrains) to completely meet the imbalance between demand and supply in the market place even at high prices prevailing in the period of scarcities. The food situation among most of these countries at several times could have become precarious due to several exogenous developments in recent years such as the 1972-1974 period of "food crisis" due to weather failures in the Asian region, the onslaught of the world oil crisis and its aftermath in terms of soaring international prices and scarcity of fertilizers. Except for Indonesia, all other four countries have been classified by the United Nations as the most seriously affected (MSA) countries by the oil crisis. The most recent increases in the price of oil announced by the Organization of Petroleum Exporting Countries (OPEC) in 1979 might further impair the capacity of some of the MSA countries to import foodgrains in times of "need" in the near future.

b. The evidence based on "calories deficit" criterion

One of the basic objectives of national food policy ought to be the provision of adequate food to all persons to meet the minimum requirement of energy intake for keeping normal health. These minimum standards of nutrition have been established by the Food and Agriculture Organization (FAO) for almost all countries of Asia. We have used the "calorie deficit" (between minimum calories required for nutritive diet and the availability of calories per person) as the second additional criterion for classifying the selected five countries of our study as "food deficit" countries. In the Asian context, the FAO has observed that the prevailing consumption patterns of energy intake are centred heavily on the calorie content of the vegetable products, especially cereals. In fact, for Asia, the average contribution of cereals to daily per capita calories supplies has increased from 66.2 per cent during 1961-1963 to 68.5 per cent during 1972-1974.[7/] Considering this pattern, increasing the consumption of foodgrains

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7/ The Fourth World Food Survey, op. cit. (table I.4.2).

in general and cereals in particular appears to be an important avenue for closing (or reducing) the "calory gap" or "calory deficit" in the countries selected for this study.

The existence of "food deficit" in terms of "calorie gap" in the Asian countries in general and in all the five countries of our study in particular can be clearly seen from the data presented in tables 5, 6 and 7. During the period 1972-1974, available supply of calories as percentage of requirement on an average as per table 5 was 92 per cent for Asia (as per FAO definition of the Far East) and ranged between 84 per cent and 94 per cent among the countries selected in our study. Table 6 indicates that during the same period, 38 per cent of the population in Bangladesh, 30 per cent of population in India and Indonesia and 26 per cent of the population in Pakistan was suffering from the "calorie gap". Table 7 shows that the required increase in cereal intake to meet the minimum dietary energy requirements in the period 1970-1974 would have ranged from 3 per cent in Sri Lanka to as high as 19 per cent in Bangladesh.

It can be safely presumed that majority of the persons suffering from "calorie gap" belong to the poor sections of the society and poorer the person in terms of income earning classes, the higher the chances of his more intensive suffering in terms of the "calorie gap". The case of India bears testimony to this presumption (see table A-6 in the appendix).8/

It is important to note that in our view, the mere fact of the reduction in imports of foodgrains (cereals) or even as a proportion of domestic production over time often interpreted by the governments of various countries as progress towards national "self-reliance" in foodgrains does not mean much until the "calorie gap" is also substantially reduced. The objective of "self-sufficiency" must be interpreted more broadly to include the provision of adequate diet for all members of the population. As the Second Asian Agricultural Survey has aptly remarked: "a claim to be moving towards self-sufficiency in foodgrains, because food imports are being increasingly replaced by domestic supplies, has little meaning if half of the country's population is under-nourished".9/

/Table 5.

8/ Incidentally, the data presented in table 8 also leads to verification of a further hypothesis at least for the Indian case) that relative to the "rural poor", the "urban poor" suffer more from the "calorie gap". However, in view of the size of the population of "rural poor" being much more than that of the urban poor, a more detailed analysis of the problems of rural poverty deserves greater attention especially in the context of the scope of this paper.

9/ Rural Asia: Challenge and Opportunity, p. 37. (See also table 8 for the Kravis adjusted measure of percentage of under-nourished population in 1975 for each of the five countries selected for this study.)

Table 5. Per capita daily calories and protein supplies for Far East and countries 1961-1963 and 1972-1974

Region/ country	Calories					Protien Supply	
	Supply		Requirement	Supply as % of requirement			
	1961-1963	1972-1974		1961-1963	1972-1974	1961-1963	1972-1974
Far East	2,010	2,040	2,210[a/]	91	92	49.0	48.0
Bangladesh	1,953	1,949	2,310	85	84	42.7	43.0
India	2,046	1,970	2,210	93	89	52.3	48.6
Indonesia	1,945	2,033	2,160	90	94	39.1	42.3
Pakistan	1,830	2,132	2,310	79	92	49.1	54.0
Sri Lanka	2,140	2,078	2,220	96	94	43.8	41.5

Source: FAO: World Food Survey, 1977.

a/ Approximately.

/Table 6.

Table 6. Per capita calorie supply and percentage and number of individuals undernourished in selected countries 1969-1971 and 1972-1974: Far East

Country	Calorie supply per capita		Critical limit (1.2 BMR)	Population with calorie intake below 1.2 BMR			
				Percentage		Number (1,000)	
	1969-1971	1972-1974		1969-1971	1972-1974	1969-1971	1972-1974
Bangladesh	1,945	1,949	1,512	38	38	25,723	27,026
India	2,034	1,970	1,486	26	30	141,214	175,162
Indonesia	1,965	2,033	1,507	34	30	40,619	38,742
Pakistan	2,146	2,132	1,512	24	26	14,508	17,223

Source: FAO, World Food Survey, 1977 (appendix M)

/Table 7.

Table 7. Dietary energy intake, energy requirements and estimated additional cereal consumption required for adequate average calorie intake, 1970-1974

Country	Energy requirements[a/]	Dietary energy source		Energy deficit	Required increase in cereal intake
		Total food[b/]	Cereal		
	(1)	(2)	(3)	(1)-(2) (4)	(5)[c/]
		(Calories/capita/day)			
Bangladesh	2,300	1,939	1,605	361	18.6
India	2,202	2,008	1,334	194	9.7
Pakistan	2,322	2,152	1,400	144	6.7
Sri Lanka	2,214	2,149	1,208	65	3.0
Indonesia	2,157	2,006	1,333	151	7.5

Source: ADB, Asian Agricultural Survey, 1976. Rural Asia: Challenges & Opportunities, April 1977 (table II.2.1, p. 176).

Notes: a/ Based on revised standards (physiological requirements plus a 10 per cent allowance for household waste.

b/ Total does not include fish.

c/ Assuming that contribution of cereals to remedying the energy deficit is in proposition with the contribution of cereals to total food calorie intake.

/The

The objective of providing for minimum nutritive diet in terms of mix of staple cereals and other food products desired by the people under local conditions has never been seriously considered for adoption as an objective to be implemented with high priority. As has been shown above, a very large proportion of the population in the "calorie deficit" developing countries does not consume the minimum required calories and proteins. This population largely comes from the poorer sections of the rural society including a large number of small and marginal farmers, the landless labourers, the rural artisans, the petty shopkeepers and low income persons engaged in the services sector such as the barbers, sweepers, washermen and the like. The basic problem of "food deficit" countries in terms of "calorie gap" criterion is not that enough food is not available in the market but that the masses of poor people lack the basic purchasing power to buy more food. Even if domestic production of foodgrains was to increase substantially (which is also required), there is no guarantee that the income distribution of the poorer sections of the society would improve so as to put more cash into their hands to enable them to purchase more food. This point has increasingly been recognized in recent literature. The International Labour Office's study cited earlier gives eloquent expression to this diagnosis of the problem in the following words: "When the poor starve, it is not mainly because there is no food but because they do not have the wherewithal to acquire food".[10/] The creation of additional output and incomes and simultaneously improving the distribution of incomes by offereing employment (or more productive employment) to the masses of poor people holds promise of solution to the problems of the "food deficit" countries". On both these fronts - the output and employment front as well as and the redistribution of incomes front - the record of planned economic development as revealed by the pattern and policies pursued in most of our "food deficit" countries so far has been relatively disappointing. These two fronts are interrelated and have reinforced the pattern of economic development as it has emerged in most of these countries. The problem of distribution is, of course, wider than the problem of distribution of incomes. It encompasses the distribution of income, wealth and economic opportunities.

/Table 8.

10/ Poverty and Landlessness in Rural Asia, op. cit., p. 17.

Table 8. Selected developing ESCAP countries: basic measures of income inequality

Country	Year	Gini coefficient	K: Kravis' conversion[a/]	Poverty incidence: Percentage of population			Poverty incidence: Definition of poverty line
				(i)	(ii)		
1. Bangladesh[b/]	1963/64			40	5		(i) Income level to ensure 90 per cent of "recommended calorie intake. (ii) Income level to ensure 80 per cent of "recommended calorie intake.
	1968/69			76	25		
	1973/74			74	42		
	1975 (1st quarter)			62	41		
	1975		59				
2. India[b/]	1960/61				42.0		Rs 15 per person per month at 1960/61 prices (weighted average at states).
	1964/65				50.4		
	1966/67				57.4		
	1968/69	0.31[c/]			53.5		
	1970/71	0.29[c/]			49.1		
	1973/74	0.28[c/]			47.6		
	1975		41				
3. Indonesia	1969/70				50.0		Annual per capita income equivalent to 240 kg and 360 kg of rice in rural and urban areas respectively.
	1973	0.41					
	1975		57				
4. Pakistan[b/]	1963/64			(i)	(ii)	(iii)	(i, (ii) (iii) Income level to ensure 95, 92 and 90 per cent of "recommended" calorie intake respectively.
	1968/69			72	54	45	
	1970/71			64	53	46	
	1975		45	74	55	43	
5. Sri Lanka	1953	0.50					Rs 200 per household per month.
	1963	0.49			72		
	1969/1970				40		
	1973	0.40					
	1975		7				

/Table 8 (continued)

Table 8 (continued)

Sources: United Nations, Economic and Social Survey of Asia and the Pacific, 1978 (forthcoming), table 7). This table has been prepared by the ESCAP secretariat on the basis of the following studies: Bangladesh: A. Rahman Khan, "Poverty and inequality in rural Bangladesh", International Labour Organisation, Poverty and Landlessness in Rural Asia (Geneva, 1977) India: Montek S. Ahluwalia, "Rural poverty and agricultural performance in India", Journal of Development Studies (London), vol. 14, no. 3, April 1978. Indonesia: S. Gupta, A Model for Income Distribution, Employment and Growth: A Case Study for Indonesia (Baltimore and London, Johns Hopkins University, 1977); D.Y. Kind and P.D. Weldon, "Income distribution and levels of living in Java, 1963-1970", Economic Development and Cultural Change, vol. 25, no. 24, July 1977, pp. 699-711. Pakistan: S.M. Naseem, "Rural poverty and landlessness in Pakistan", International Labour Organisation, Poverty and Landlessness in Rural Asia. Sri Lanka: Central Bank of Ceylon, Report of the Survey of Ceylon's Consumer Finances, 1953, 1963 and 1973 (Colombo, 1954, 1964 and 1974); Lal Jayawardena, "Sri Lanka - country experience", H. Chenery and others, Redistribution with Growth (London, Oxford University Press, 1974).

Notes: a/ K (Kravis' conversion) is the poverty line corresponding to the income level of the 40th percentile in India which is estimated as the level required to achieve a calorie intake of about 2,150 per person per day. This level is applied internationally using the "Kravis' conversion" to allow for differences in purchasing power among countries.

Source of data: A. Binnendijk, "Socio-economic indicators of basic needs, progress and commitment for 92 developing countries" (Washington, D.C., United States Agency for International Development, 1978) (draft, mimeo.).

b/ Rural areas only.

c/ Based on consumption data.

d/ Provisional estimate.

/Several

Several studies of the distribution of income and wealth (measured by the size distribution of the ownership of land in rural areas) relating to the five countries being studied by us point out towards not only the existence of vast inequalities among various groups of economic units but also somewhat growing inequalities between the richer and the poorer sections of the rural society over time. Thus, for example, on the basis of the studies prepared by S.M. Naseem for Pakistan, by Indira Rajaraman, Rohini Nayyar and C.T. Kurien for the four states of the Indian Union (Punjab, Uttar Pradesh, Bihar and Tamil Nadu), by Azizur Rahman Khan for Bangladesh, by E.L.H. Lee for Sri Lanka and by Ingrid Palmer for Indonesia with special reference to Java, spanning a period of 10 to 25 years (1950-1975 period) for different countries, the sponsoring authorities of these studies (International Labour Office) have concluded as follows:

> "The most outstanding facts to be noted are the worsening distribution of income and declining real income of the rural poor at least in a number of cases. Those studies which contain the relevant data show that the shares of the lower docile groups in aggregate income and consumption have been declining even during periods of relatively rapid agricultural growth. There are significant differences from country to country as regards the proportion of population that has been adversely affected, but in each country for which data exist, a substantial proportion of the lowest income groups appears to have experienced a decline in their share of real income over time. .... (Despite some problems regarding the inter-country comparisons of the poverty line derived from an estimate of the level of income necessary to ensure a minimum diet) ....
>
> In each case, however it was found that the proportion of population below the "poverty line" has been increasing over time ....
>
> The countries studied ... are all characterized by a highly unequal distribution of land ownership .... Although there is some form of land reform legislation in nearly all of the countries studied, the progress towards redistribution of land during the periods considered ... has not been such as could have contributed to a sizeable reduction of inequality in land ownership" .... The continuation of the highly unequal ownership of land during a period of rapid demographic growth has resulted in increased landlessness and near landlessness"[11/]

Some evidence on the widespread and often growing incidence of poverty over time among the countries being studied by us is presented in table 8. Kravis has recently attempted to improve the comparability of measuring poverty across countries by adopting a uniform minimum standard of calorie intake and converting the values not at the official exchange

/rate

11/ Poverty and Landlessness in Rural Asia, op. cit, pp. 9-11.

rate but correcting them to reflect the differences in purchasing power" of the local currencies.[12/] This one point picture (for 1975) of the Kravis et. al. adjusted computations of the percentage of population below the poverty line show this percentage to be 7 per cent in the case of Sri Lanka, 41 per cent for India, 45 per cent for Pakistan, 57 per cent for Indonesia and 59 per cent for Bangladesh.

Similarly, evidence on the existence of vast structural inequalities in the ownership of land prevailing in the rural areas of the countries being studied by us for the latest year for which data is available with us is presented in tables A-7.1 to A-7.5.[13/]

7. Some implications of structural inequalities of distribution of income and wealth

The wide spread poverty reflecting highly inequitable distribution of incomes and the growing concentration of economic power in the hands of the richer and upper middle classes reflected through the structure of ownership of productive assets (land in the case of rural areas) have serious implications in terms of the pattern of economic development which has emerged in most of the "food-deficit" countries of the ESCAP region selected for this study. The pattern which has emerged, of course, is not solely due to the effects of the institutional factors operating through the prevailing power structure in the villages (and in the cities if the analysis was to be extended to cover the entire economy). It has in fact been shaped by the interaction of technology, market, government policies and institutional factors but the latter have played quite an important role in influencing the way in which growth policies have been implemented in most of these countries.

The implications of the structural factors linked closely to the distribution of income, wealth and economic opportunities for the emerging pattern of economic development of the selected countries can be conveniently analysed in terms of the pattern of output, investment and employment

/(supply

12/ For further details on the "Kravis Conversion" factors, see Kravis, Heston and Summers, Real GDP Per capita for 116 countries in 1970 and 1974, World Bank, 1978 as reproduced in Montek S. Ahluwalia et al., Growth and Poverty in Developing Countries, World Bank Staff Working No. 309, Dec. 1978.

13/ The data is usually not available for all countries on the size ownership of land. In the case of Pakistan and Sri Lanka, the data is based on farm size of holdings and we have attempted to interpret the data to derive some conclusions on the ownership implications of the available data. It is well known that in general, the structure is more unequal in terms of the ownership of land than in terms of farm size (operational holdings) in these countries. Due to the nature of data available for Sri Lanka, we have faced special difficulties in processing data as given in table A-7.5.

(supply side) and consumption including imports (demand side). In the market place, the price mechanism (including price policy interventions by the government) works in terms of the interaction of both supply and demand factors and in practice it is difficult to compartmentalize the impact of policies into these two types of factors.

2. The supply side

The major plank of agricultural growth in most of the selected countries in the 1960s and 1970s has been the technology based on the increased use of modern inputs such as the High Yielding Varieties of seeds, fertilizers and irrigation. Since these inputs are used mostly in a complementary fashion, we can illustrate their increasing use by citing the data on the proportion of area planted in Wheat and rice with High Yielding Varieties of seeds. This is shown in table 9(a) for wheat and table 9(b) for rice. These tables confirm the increasing trend of planting higher wheat area and rice area with modern varieties. Even though the modern technology is scale neutral and comparatively more profitable, the benefits of increased output and incomes of this technology have bypassed most of the small and marginal farmers. Access to these modern inputs which are generally more capital-intensive (even for working capital requirements) in the villages is usually controlled by the richer land-owners and they alone have the capacity to buy these inputs. The input delivery system for these modern inputs even where it is subsidized by the governments in practice is biased in favour of the richer land-owners. Even the schemes for rural credit evolved by or subsidized by the governments have so far favoured the richer sections of the rural society.[14/] The price support and incomes policies of governments for farmers growing food also could not given much benefit to the small and marginal farmers in view of the limited marketable surplus available with them. The management aspects of the new technology even when they are adopted by the small and marginal farmers leave a lot to be desired for their efficient use. This is mainly because

/Table 9(a)

14/ Asian Development Bank, Rural Asia: Challenge and Opportunity, op. cit., Ch. 5. One exception to this generalization has been the new Regional Rural Banks established in India since 1975 which provide credit only to the weaker sections of the rural society, namely, the small and marginal farmers, landless labourers, rural artisans and the like. These banks, while doing good work, are still in their infancy and not yet widespread in terms of geographical coverage and cover only insignificant proportion of the total requirements of the credit of the target sections so that their impact on the total rural credit scene is extremely limited at present. For an evaluation of this scheme of rural credit, see Charan D. Wadhva, Rural Banks for Rural Development: An Analysis of the Working of Regional Rural Banks in India with two Case Studies (to be published by Macmillan, India, 1979).

Table 9(a). Estimated percentage of area planted to high-yielding varieties of wheat in total wheat area in selected ESCAP countries

	Bangladesh	India	Pakistan
1965/66		Negligible	0.1
1966/67		4.2	1.9
1967/68		19.6	16.0
1968/69	7.2	30.0	38.0
1969/70	7.6	30.1	43.0
1970/71	11.3	35.9	52.3
1971/72	11.8	41.1	56.7
1972/73	17.7	51.4	56.7
1973/74	23.1	57.4	59.0
1974/75[a/]	23.4	61.7	62.5[b/]

Source: Dana G. Dalrymple, "Development and spread of high-yielding varieties of wheat and rice in the less developed nations", Economic Research Service, U.S. Department of Agriculture in Co-operation with U.S. Agency for International Development, August 1976, as cited in Second Asian Agricultural Survey (Manila, Asian Development Bank), p. 344.

Notes: a/ Preliminary.
b/ Unofficial estimate.

Table 9(b). Proportion of total rice area planted to modern varieties in selected ESCAP countries

(percentages)

Country	1968/69	1971/72	1974/75
Bangladesh	1.6	6.8	14.8
India	1.3	19.1	28.4
Indonesia	2.5	16.0	40.3
Pakistan	19.8	50.0	39.3
Sri Lanka	1.1	13.1	67.1

Source: International Rice Research Institute, World Rice Statistics, April 1977.

/of

of the information gap on the use of modern technology by this group of farmers to whom the benefits of the schemes of agriculture extension and education hardly reach.

9. Employment effects

While the basic modern technologies for increasing food (and agricultural) production are capital-intensive (especially irrigation), the effect of their use on the employment situation has been positive. The empirical evidence from a number of farm surveys presented in table 10 clearly suggests that the labour input per hectare per crop after the adoption of high yielding varieties has gone up considerably compared to the use of traditional varieties. However, the same is not true of the effects of the adoption of certain mechanical technologies (like tractors, harvesters, threshers) were negative, since these were basically labour-saving in character without any substantial impact on raising productivity and incomes. While the impact of irrigation has also been highly conducive to generating more employment,[15/] there have been clear limits on the creation of additional jobs through the new technology. The high yielding varieties have yet not spread to all the feasible areas and have not yet been adopted by a large number of small and marginal farmers. Similarly, irrigated areas constitute typically only 30 per cent of the total cultivated area and most of the land in these countries is under rain-fed conditions. No significant technological breakthroughs have yet been achieved suitable for rain-fed areas.

On the other hand, there have been several other negative influences on the employment situation. The pattern of consumption and investment expenditure of the richer landlords who benefitted the most from the impact of "green revolution" has been such that more demand was generated for imports of (or domestically produced) machinery and equipment which were largely, "labour-saving" or for luxury consumption goods. These products generally require more capital-intensive techniques of production. Thus the employment linkages of this pattern of investment and expenditure were clearly weak. Furthermore, the land reform programmes formulated by

/Table 10.

15/ The Second Asian Agricultural Survey observed that direct on-farm increase in employment made possible by irrigation has been as high as 8- per cent, particularly for tube wells and other small irrigation facilities. See Rural Asia, Challenge and Opportunity, op. cit. p. 61.

Table 10. Labour input per hectare per crop and change in labour input accompanying adoption of high yielding varieties for selected case studies in the Far East

Location	Traditional variety (man/days/hectare)	HYV (man/days/ hectare)	Change due to HYV (%) (2) ÷ (1)
	(1)	(2)	(3)
Bangladesh	137	194	+41.6
India:			
Rajasthan[a/]	57	75	+31.6
Orissa	145	169	+16.6
Indonesia:			
Central Java	234	197	-15.80
East Java	253	287	+13.4

Sources: Asian Development Bank, Asian Agriculture Survey, 1976. Rural Asia: Challenge and Opportunity, April 1977 (Table I-3.7, page 60).

Note: a/ Wheat, all other observations are rice.

/several

several governments generated tensions in the villages and probably the worst hit in this process were the tenants and sharecroppers who were thrown out of their jobs by the landlords who wanted to preserve their control over land. The worsening distribution of incomes and ownership of land pointed out earlier led to several small farmers swelling the ranks of landless labourers aggravating the already acute situation of unemployment and underemployment in agricultural in most countries. The plight of the rural poor, especially agricultural landless labourers, was worsened by the high rates of inflation prevailing in recent years in most of the selected countries.16/ This point can be illustrated with reference to the Indian experience. Table A-8 in the appendix shows that the consumer price indix for agricultural labourers with the base 1960-61 jumped upto 286 at the end of 1973-1974 whereas the general consumer price index relevant for deflating total GNP at that time had risen to 241. The real incomes of agricultural labourers consequently fell substantially in the period 1960-1961 to 1973-1974.

While the share of agriculture in total labour force continued to decline over time in most of the countries due to migration of labour from the agricultural sector mainly to the manufacturing sector as is shown by table A-9 in the appendix, the demographic pressure continued to add to the agricultural labour force in most of our reference countries at rates much higher than agriculture could absorb. This added to the proportion of the unemployed and underemployed in the agricultural sector and increased the size of the army of the unemployed seeking jobs in the industrial (and services) sector(s). The rates of growth of labour force in the non-agricultural sector thus usually increased at a faster rate in most countries during 1965 to 1975 as shown in table A-9. Unfortunately, the experience has shown that the industrial sector also could not generate sufficient jobs to absorb the growing number of persons (including new entrants to the labour force) seeking jobs.

/10.

16/ According to the data presented on the annual average trend rates of growth of prices by the World Bank for the period 1970-1976, these rates were 20.7 per cent for Bangladesh, 9.2 per cent for India, 22.7 per cent for Indonesia, 15.2 per cent for Pakistan and 11.5 per cent for Sri Lanka. The discriminatory effects of inflation on the fixed income groups and poorer sections of the society are well known.

10. Impact of government policies

The strategy of development which has been formulated and implemented by the planning authorities through various governmental policies and programmes in most of the countries selected for this study has given more emphasis on import substituting industrialization programmes based on the adoption of more capital-intensive technologies with accompanying urban bias to the relative neglect of the improvement of conditions in the rural areas. Generalizing from the experiences of industrialization and trade policies of several developing countries undertaken by the Organization for Economic Co-operation and Development, Ian Little et al. have observed the following in the context of agricultural development of the selected countries:

> "Agricultural output is also affected by the policies favouring industry. There has been a relative neglect of agriculture in the allocation of investment. Although subsidies are sometimes provided for agriculture, in the form of protection against agricultural imports, extension services, irrigation, and provision of fertilizers, such subsidies are certainly a very low proportion of value added in agriculture and do not significantly affect the bias against agriculture created by the protection of industry, and concomitant, an overvalued exchange rate. Food production in, for example, India, Pakistan ... has barely kept up with the growth of population; and agricultural production for export has been similarly affected. A concomitant of over-investment in manufacturing industry has been inadequate investment not only in agriculture but also, at least in some countries, in the transport, power, and communication industries which provide essential services not only to manufacturing but also to all other sectors".17/

The distortions in the factor markets are introduced by the policy of artificial cheapening of capital relative to labour through various fiscal measures (such as tax holidays and write-offs of certain investment expenditures from taxable income), monetary measures (providing adequate credit at relatively lower rates of interest than the opportunity cost of capital) and trade and exchange rate policies (through high tariff walls on import substitute products on the one hand and overvalued exchange rates on the other for lowering the cost of imported machinery, raw materials and components). Such distortions naturally lead to a strong bias in favour of investment in the more capital-intensive sectors and in the more capital-intensive choice of techniques of production. Such a process obviously lowers the demand for labour than it otherwise would have been. This leads to generation of lesser employment opportunities in the economy, especially

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17/ Ian Little, Tibor Scitovsky and Maurice Scott, Industry and Trade in Some Developing Countries: A Comparative Study (London, Oxford University Press, 1970) p. 9.

in the manufacturing sector. As the International Labour Office (ILO) study cited earlier has stated, "Paradoxically, the relatively high productivity of labour associated with the more mechanized process may lead to higher wages for those who find employment in the sector, thereby further reducing the demand for labour".[18/] What is more, the impact of these distortions in the factor markets through the price mechanism is to reinforce the unequal distribution of income arising from the highly unequal distribution of productive assets. The result, is that those who have access to the organized capital market or agencies supplying rural credit are able to obtain finance for their requirements of working capital as well as longer term investments on relatively favourable terms. Thus, the rich become richer and the gulf between the "rich" and the "poor" widens.

11. The demand side

On the demand side, the growing poverty and worsening distribution of income and wealth among the poorer sections of the rural society have severely constrained the size of the market even for agricultural products (including food) and also for industrial products. The Cash nexus which links production (income) and consumption (expenditure) processes among the agricultural and industrial sectors in terms of the participation of the mass of economic units in these processes has been missing for the poorer sections of the rural society. This has naturally had dampening effect on the incentives for increasing agricultural production (including foodgrains) as well as industrial production. Coupled with the growing inequalities among the urban poor and the urban rich, several industries have periodically felt the impact of the so-called "industrial recession". The relative stagnation of industrial production and the phenomenon of "sick" units withnessed in recent years in a vastly populated and industrializing country like India bears eloquent testimony to the constraints imposed by effectively small size of the market for industrial goods consisting of the urban elite and richer farmers.[19/] Thus, the interlinkages between the agricultural

/and

18/ Poverty and Landlessness in Rural Asia, op. cit., p. 21.

19/ Cf., K.N. Raj, "Growth and stagnation in industrial development", Economic and Political Weekly, Vol. XI, Nos. 5 and 7, Annual Number 1976, pp. 223-236.

and industrial growth have been rather weak in most of the food-deficit countries of the ESCAP region. It is indeed a sad commentary on the development of most of these countries that whatever industrial development has taken place under sheltered market conditions has largely bypassed the agricultural sector and, therefore, not led to a self-sustaining and mutually supportive processes of economic growth of the various sectors of these economies.[20/]

12. Empirical evidence on the degree of growth linkages between agricultural and industrial sectors

The above observations on the tenuous intersectoral linkages between growth in the agricultural and industrial sectors in most of the countries selected for this study are supported by the empirical analysis of such "linkages" presented in the Second Asian Agriculture Survey. This survey had specially attempted to quantify the magnitude of the intensity of such interlinkages which are induced by input demand and which are induced by out ut supply in four different ways:

(i) by devising a measure of the strength of the direct backward linkage caused by changes in the level of production within a sector, known as the "coefficient of backward linkage", and denoted symbolically as U.

(ii) by devising a corresponding measure of the strength of direct forward linkages between one sector and the rest of the economy, known as the "coefficient of forward linkage," and denoted as Il.

(iii) by devising another measure of the economy-wide impact of increased production within a sector, known as the "total linkage coefficient," which accounts both for direct linkages and for the indirect linkages induced via feedbacks and spillovers to other sectors not directly linked with the sector in which production initially increased; this index is denoted by Y.

/(iv)

20/ Under such circumstances, the possibilities of exports of industrial products appear to be a logical outlet to be explored. However, due to the pattern of industrialization achieved and industrial policies pursued, even these possibilities have some obvious limits once the costs of export promotion are concerned. With plants of lower capacity established compared to international standards, and operated under higher rates of effective protection compared to export subsidies, the entrepreneurs do not find large scale exporting as an attractive business proposition for several non-traditional industrial products.

(iv) by devising an index which measures the total of direct and spillover inducements to a particular sector (say agriculture) caused by changes in the levels of production in all of the other (non-agricultural) sectors. This measure is known as the "coefficient of total linkage receipt" and is denoted by $\underline{Z}$. (AAS-II, p. 112).

The computed results of the above-mentioned exercise are presented for three countries in table 11.[21/]

The Second Asian Agriculture Survey also found similar patterns of intersectoral linkages in consumption. Thus, the over-all situation presented by this Survey strongly supported the hypothesis that the intersectoral linkages between agricultural and industrial sectors in most of the food deficit countries of the ESCAP region have been generally weak in the recent past.

/Table 11.

21/ This table is based on the detailed numerical estimates of the size of coefficients and their rankings as shown in table A-10 in the appendix. The formulas for computing the coefficients are also given in the note to this table.

Table 11. Relative strength of intersectoral linkage coefficients in selected food deficit countries of the ESCAP region

Country and year	Coefficient of relative strength			
	U	W	Y	Z
India (1973/74)				
Food crops[a/]	W	M	W	MS
Industrial crops, animal husbandry[b/]	W	M	W	MS
Indonesia (1971)				
Food crops[c/]	M	MS	M	MW
Industrial crops, animal husbandry[d/]	M	MS	MS	M
Sri Lanka (1965)				
Food crops[e/]	W	MS	W	MS
Industrial crops, animal husbandry[f/]	W	MW	MW	M

Notes: Based on standardized average rankings within broad sectoral categories where S = strong; MS = medium strong; M = medium; MW = medium weak; and W = weak.

a/ Includes sectors: foodgrains and other agriculture.

b/ Includes sectors: animal husbandry and plantations.

c/ Includes sectors: paddy and other staple food crops.

d/ Includes sectors: other agricultural crops and livestock and products.

e/ Includes sectors: paddy (including straw for paper) and other agriculture.

f/ Includes sectors: tea including processing, rubber including processing, coconuts including toddy and livestocks.

II. THE MAGNITUDE OF "FOOD DEFICITS" IN SELECTED COUNTRIES IN THE 1980s AND TASKS AHEAD

Several alternative projections of food production and requirements computed under various assumptions for future with terminal years at 1985, 1990 and even year 2,000 are now available for most of the countries selected for our study. The Second Asian Agricultural Survey (carried out by the Asian Development Bank) made such projections for the year 1985 on the basis of an elaborate econometric model.[22/] The International Food Policy Research Institute (IFPRI) has published such projections for several countries of the world for the year 1990.[23/] The most recent work on such projections is being presently carried out by the Food and Agricultural Organisation (FAO) of the United Nations.[24/] We can look at the alternative future scenaries presented by these sources to gauge at the magnitude of the likely "food deficits" (or otherwise) of the countries selected for this study.

1. The projected "food deficits" by the Second Asian Agricultural Survey

The projections of domestic supply and demand for cereals (which is the dominant group of foodgrains in the consumption expenditure of most Asians) together with the statement of the alternative assumptions are presented in table 12. The demand estimates are based on the two variants of "high" growth rates and "low" growth rates of GDP and agricultural output (incomes at constant prices), assumed rates of growth of population and estimated income elasticities of demand for cereals. These projections reveal that all the major "food deficit" countries of the ESCAP region identified by us would continue to be "food deficit" countries in 1985 - under both variants of "high" and "low" agricultural growth situations - as far as the supply-demand balance for cereals is concerned. The cereal deficit projected would, of course, be larger for most of these countries under "low" growth situation. In fact, as table 12 shows, the projected cereal deficits for 1985 for all our reference countries would be many more times the prevailing deficits in the base period (1972).

/Table 12.

22/ Rural Asia: Challenge and Opportunity, Op. cit.

23/ International Food Policy Research Institute, Food Needs of Developing Countries: Projections of Production and Consumption to 1990, Research Report 3 Washington D.C., Dec. 1977.

24/ FAO, "Agriculture Towards 2,000 (Project Statement as of end-June 1978)", (Rome, 1978) (unpublished).

Table 12. Projected levels of domestic supply and demand for major cereals in selected countries of Far East in 1985

	Growth rates (1972 to 1985) of			Projected domestic demand in 1985 for			Projected domestic supply in 1985 of			Over-all cereal balance	Over-all cereal balance
	GDP	Agr. output at constant prices	Population	Rice (paddy)	Wheat	Maize	Rice (paddy)	Wheat	Maize	in 1985	in base period 1972
	(per cent per annum)			(000 metric tons)							
A. "High" Agricultural Growth Situation											
1. Bangladesh	5.2	3.8	3.0	27,927	1,936	3	26,228	495	7	-3,137	-2,037
2. India	5.1	3.9	2.3	98,289	41,881	9,778	96,608	42,903	7,525	-2,912	-2,913
3. Pakistan	5.2	4.3	3.4	4,700	3,735	1,139	5,620	12,195	1,336	-423	-93
4. Indonesia	5.6	3.2	2.9	42,896	1,286	4,599	29,539	-	5,000	-14,241	-1,990
5. Sri Lanka	4.5	3.8	2.3	3,333	875	30	2,296	0	42	-1,901	-1,136
B. "Low" Agricultural Growth Situation											
1. Bangladesh	3.1	2.3	3.0	25,816	1,743	3	21,358	312	5	-5,888	-2,037
2. India	3.7	2.8	2.3	91,475	38,284	9,955	84,172	35,532	7,525	-12,484	-2,913
3. Pakistan	3.5	2.9	3.4	4,391	12,543	1,139	4,795	9,526	1,169	-2,582	-93
4. Indonesia	4.4	2.5	2.9	38,924	1,120	4,351	27,252	0	4,512	-12,360	-1,990
5. Sri Lanka	2.8	2.4	2.3	2,951	807	29	1,988	0	40	-1,759	-1,136

Source: ADB, Asian Agricultural Survey 1976 (Table II-2.4, pp. 180-181).

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2. The IFPRI's projections

The International Food Policy Research Institute (IFPRI) has also made consumption projections for major staple foodgrains for 1990 on the basis of the two basic independent variables, namely, the rates of growth of population and income. As table 13 shows, IFPRI has estimated "food deficit" (by effective demand criterion) for 1990 to be of the order of 10 to 12 per cent for India, 14 to 17 per cent for Indonesia and 30 to 35 per cent for Bangladesh. It has computed consumption requirements on the basis of four alternative criteria: (i) maintaining 1975 levels of per capita availability; (ii) assuming a low income growth situation; (iii) assuming a high income growth situation; and (iv) assuming consumption to grow so as to meet 110 per cent of the minimum dietary requirements of nutrition as set by the FAO. Some of the details of the assumptions and the actual numerical estimates of projected consumption in metric tons by IFPRI are presented in tables A-11 and A-12 in the appendix. A summary of the major findings of this study in terms of required growth rates of production of major staples for meeting each of the targets of consumption set under four alternative criteria (listed above) is provided in table 14. The required growth rates of production under all these ways of setting consumption targets are much above the trend rates of growth of output historically experienced by our group of countries.

3. FAO's projections

The FAO's Fourth World Food Survey (cited earlier) had computed the average annual growth rate in energy supply required during the period 1972-1974 to 1990 for all the Most Seriously Affected (MSA) countries, namely Bangladesh, India, Pakistan and Sri Lanka. By "Calorie gap" criterion, all these countries would remain "food deficit" as shown by the FAO (see table 15) unless output of energy-intensive food products grows at the annual average rate of 4.3 per cent in Bangladesh, 3.9 per cent in India, 4.2 per cent in Pakistan and 3.0 per cent in Sri Lanka. These are high rates of growth and are unlikely to be achieved if the present policies relating to the food sector continue to remain unchanged.

/Table 13.

Table 13. Actual food deficits in 1975 and projected food deficits for 1990: the Far East

Country	Actual 1975		Projected 1990	
	Million metric tons	Percentage of consumption	Million metric tons	Percentage of consumption
Irdia	1.4	1	17.6-21.9	10-12
Bangladesh	1.0	7	6.4-8.0	30-35
Indonesia	2.1	8	6.0-7.7	14-17

Source: IFPRI, Food Needs of Developing Countries Projections of Production and Consumption to 1990, December 1977, p. 18.

/Table 14.

Table 14. 1975 estimated and projected growth rates of population and 1975-1990 target growth rates of major staple production in developing economies of the Far East

Region/country	Population				Major staple production, 1975-1990, needed to meet 1990 consumption target			
	1975 population (thousands)	1960-1975	1975-1990	1960-1975 trend projected	At 1975-per capita levels	Low income growth	High income growth	At 110% of dietary requirement
	(Average annual growth rate)				(..... per cent .....)			
Asia	1,120,965	2.53	2.53	2.8	3.0	3.6	3.9	4.1
Bangladesh	74,791	2.30	2.40	1.3	2.6	2.9	3.3	2.8
India	620,929	2.43	2.41	2.5	2.6	3.2	3.4	4.0
Indonesia	137,830	2.59	2.48	3.0	2.9	4.0	4.3	3.7
Pakistan	71,721	2.93	3.20	5.4	3.5	4.2	4.4	4.6
Sri Lanka	14,128	2.26	1.89	3.4	7.0	7.8	8.0	8.8

Source: IFPRI, Food Needs of Developing Countries: Projections of Production and Consumption to 1990, December 1977, pp. 138-139.

/Table 15.

Table 15. Average annual growth rate in energy supply required during the period 1972-1974 to 1990 and the implied amount in wheat equivalent for selected MSA countries of the Far East

Country	Average annual growth rate in energy supply (percentage)	Absolute increase in wheat equivalent	
		Average per year (thousand tons)	Total increase during the period 1972-1974 to 1990 (thousand tons)
Bangladesh	4.3	975.3	16,580.5
India	3.9	7,084.7	120,439.1
Pakistan	4.2	965.6	16,415.7
Sri Lanka	3.0	126.1	2,143.9

Source: Food and Agriculture Organization, World Food Survey, 1977, table II.3.4.

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4. Tasks ahead

The inevitable conclusions which emerge from the projections of supply and consumption requirements by the various sources surveyed above relate to the need for substantial increases in the output of foodgrains (or augmenting availabilities through imports or food aid on a large scale which do not appear feasible) required to sustain even the current per capita availabilities. The world has not yet evolved a satisfactory World Grain Reserve System. The required increases in output of foodgrains would have to be higher if the required minimum dietary needs of the entire population are to be met. And the required increases in output would have to be even higher if these minimum standards have to be surpassed by a reasonable margin.

Furthermore, provision of employment to all able bodied persons is an objective of national development policies of all countries. As creation of additional employment is substantially dependent on the prospects of availability of foodgrains as the basic wage good, the need for increased output food in the "food-deficit" countries is of utmost importance. As table A-13 in the appendix shows, the annual average rate of growth of total labour force during 1975-1985 is likely to exceed 2.3 per cent per annum for all our reference countries. The need to provide employment even for the new entrants to the labour force will make substantial demands on the foodgrains sub-sector of these countries. As John Mellor has pointed out, the sharply different consumption patterns and needs of the poorer sections compared to those of the richer sections "preclude solving the poverty problem through marginal redistribution of income" and that the removal of the twin curse of poverty and unemployment "now require vast further increases in food production as well".[25/]

5. The "potential performance" gap

The additional requirements of food production for 1980's for most of the countries selected for this study need not prove to be "impossible" to be achieved provided appropriate strategies are formulated and effectively implemented. There is substantial room for improving the farming practices even in the traditional agricultural areas. Modern technology still holds the promise of delivering much greater yields in most parts of the world. The biological potential and actual performance gap for most crops is substantial. The possibilities of increasing yields are quite high in the case of rice as per current knowledge about research and development.[26/]

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25/ John W. Mellor, "Rural Poverty and Agrarian Reform", as reprinted in the Financial Express (Bombay), 1 February, 1979, p. 4.

26/ See International Rice Research Institute, Research Highlights for 1977 (Los Banos, 1978). The recent report of the Trilateral Commission's Tokyo Symposium on "Plan for Doubling Rice Production in Asia" 27-28 November 1978) also supports this observation.

6. The recent crop outlook and prospects for 1980s

The performance of output of foodgrains and of agriculture in general has been quite encouraging in most of the "food deficit" countries of the ESCAP region during the last two years and 1979 also promises to be a "good" agricultural year. The planners in India and Pakistan at least are now convinced that their countries will not require to import foodgrains except as a short run smoothening factor for the influences of occasional draughts etc; and good possibilities exist for these countries to become exporters of major foodgrains. The supporting projections of supply and demand for major cereals from national sources upto the year 2,000 are presented in the appendix table A-14 and A-15 for India (National Commission on Agriculture) and in tables A-18 and A-19 for Pakistan. The case of Bangladesh appears to be the most difficult one in terms of its prospects for meeting even the effective market demand while Indonesia also seems to be heading for a situation of continuing deficits of food (in the market sense) unless it succeeds in opening up new areas for cultivation of foodgrains in its sparsely populated islands.

7. The development needs and required tasks

The improvements recorded in the production of foodgrains (cereals) in the last two years in most of the "food deficit" countries of the ESCAP region need not create any euphoria of the achievement of (or substantial progress towards) "self-sufficiency" on this front. The performance of last two to three years when the weather has been continuously favourable cannot be depended upon to continue for ever. The long term trends of per capita growth of food production are likely to continue in most of these countries. The implementation capacity of the governments for new programmes for increasing food production may not improve substantially. Some of these countries (like Bangladesh) will continue to find it difficult to substantially increase the per capita availabilities of foodgrains. Moreover, what is important for the achievement of true self-sufficiency in the food sub-sector is the provision of adequately nutritive diet for all members of the population sufficiently the minimum standards. This would require very substantial increases in the output of foodgrains. As the capacity to create additional jobs crucially de depends on the increased availability of the foodgrains, programmes for increasing their output will have to be given a very high priority. These programmes would have to be an integral part of the rural development efforts.

/Linked

Linked to the questions of increasing the output of foodgrains are the general questions of strategies for increasing the agricultural output and strengthening of the interlinkages between the growth of the agricultural and the industrial sectors so as to create conditions for mutually supportive self-sustaining economic growth in the economy. Simultaneously, there is a need to ensure that the pattern of growth leads to greater social justice by improving the distribution of income, wealth and economic opportunities. Improving the lot of the masses of poor people requires the provision of not only minimum dietary needs but also other elements of "basic minimum needs" such as clothing and footwear, housing, fuel and lighting, and facilities like adequate medicare, education as identified, for example, by the International Labour Office. We believe, and there is some evidence to this effect, that policies aimed at better distribution of income and wealth (mainly land in the rural areas) and economic opportunities aimed at the provision of basic minimum needs to all population would lead to higher productivity and growth of output in agriculture as well as other sectors. The recent study jointly sponsored by FAO and the Indian Institute of Management, Ahmedabad supports this conclusion. In addition, the continuing demographic pressure makes it imperative to plan for creation of additional employment opportunities both on farm and off farm by use of appropriate technology and thereby generate the necessary cash nexus to support the growth in the agricultural and industrial sectors of the economy. These are the major tasks facing the "food deficit" countries of the ESCAP region in their quest for acceleration of the rate of growth with greater social justice so as to remove the scourge of massive poverty within a relatively short period of time.

III. DEVELOPMENT STRATEGIES FOR THE 1980s

While the tasks ahead of the "food deficit" countries of the ESCAP region are by now well recognised, the crucial requirement is to formulate appropriate development strategies and to implement them effectively as a co-ordinated set of policies and programmes at the national level. The weaknesses of the development strategies followed so far in our group of countries as diagnosed in section I must be removed and new positive set of policies and programmes be designed and effectively implemented so as to achieve the developmental tasks identified in section II. We present below strategies which we believe would be more appropriate to the needs of the countries selected for this study.

/1.

1. Structural reforms

As diagnosed in part I, the major development problems of the selected countries reflected in the slow growth and non-percolation of the benefits of rural poor have been due primarily to the structural factors. The new development strategies would, therefore, have to be based essentially on structural reforms.[27/]

These agrarian reforms must ensure the participation of the masses of poor persons - a large number of small and marginal farmers, landless labourers and other persons engaged in low income professions in villages - into the mainstream of production and consumption activities. Analysing the mainsprings of agricultural growth in India, V.S. Vyas has justifiably concluded that "rapid and sustained agricultural development in this country can take place only when all agricultural workers - cultivators and wage-paid labourers - can contribute to the production programmes. Since a vast majority of the cultivators are small and marginal farmers, the nature of technology, institutional change, and supportive systems have to be adopted to small farm agriculture".[28/] Undoubtedly, most of the small and marginal farmers (defined with respect to a potentially minimum viable size of farm) have remained a disadvantaged group and faced several constraints mainly due to their non-access to the modern farming inputs and credit usually controlled by the landowners with much bigger size of farms, we believe that these constraints can be relaxed through what Vyas has termed as "appropriate social interventions". These can be usefully tried in the other countries as well.

The most important social intervention would be the organization of the small and marginal farmers into small co-operatives. To be effective, these co-operatives must be provided with all the necessary supportive facilities such as adequate rural credit and farm inputs and market information so as to improve the economic base of the members as an organized group vis-à-vis the richer sections of the society. Such co-operatives operating at the grass-roots level must be given a fair degree of autonomy and clearly delineated powers of decision making within the framework of participative management. The Second Asian Agricultural Survey also favoured the formation of the smaller sized primary

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27/ Cf. John W. Mellor, "Rural Poverty and Agrarian Reform", op. cit.
28/ V.S. Vyas, "Mainsprings of Agricultural Growth in India", Journal of the Indian Society of Agricultural Statistics, 1977, pp. 1-2.

organizations to neutralize the negative effects of the prevailing hierarchical structures in the villages based on the power of the size of land ownership.[29/] Support will be required from the local bureaucracy and the police to ensure that the members of these small co-operatives belonging to the weaker sections of the society are not unduly harassed by the vested interest groups of richer and upper middle income farmers in the villages. Later on, these co-operatives can be allowed to expand in size and membership as they get established and are able to show success measured by the growth of incomes of each of the members of such co-operatives and allowed to diversify their activities.

Similarly, small co-operatives should be set up for the poor persons engaged in non-farming activities in the villages, such as the rural artisans, the weavers, the cobblers, the milkmen with small numbers of milch animals, barbers, the sweepers and the washermen.[30/]

In order to make such co-operatives effective, their members will have to be given elementary training in management techniques so that they can work with simpler but efficient management systems. A cadre of rural managers ("barefoot managers") needs to be formed locally which can manage small business along professional lines. These co-operatives must be insulated from the local politics.

There is also a need to organize the landless labourers so that they are aware of the possibilities of benefits supposed to accrue to them from the various developmental schemes formulated by the governments for generating more employment locally and in nearby towns and cities. Special training programmes can be organized for them in small batches with guaranteed jobs for them.

The second major element of structural reforms relates to the setting up of some service organizations which exclusively serve the well-defined target groups (individuals and small co-operatives of such individuals) belonging to the poorer sections of the rural society. The Regional Rural Banks in India, to which reference has been made earlier, which provide credit only to the

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29/ To quote, "Semi-spontaneous, small, primary organizations operating on the basis of direct participation and serving well-defined common interests, are more likely to ensure member loyalty than large, formal co-operatives which encompass a large number of functions, Rural Asia: Challenge and Opportunity, op.cit., p.14.

30/ Among others, the formation of such co-operatives in the context of rural development programmes has also been proposed by Charan Wadhva. See Charan D. Wadhva, Rural Banks for Rural Development, op.cit.

small and marginal farmers, agricultural labourers and rural artisans and the like can be cited as an illustration of such service organizations.[31] Special public expenditure programmes can be formulated which mainly serve the needs of the poorer sections. It is often pointed out that such discriminatory schemes favouring the poorer sections are very costly to operate and face the practical difficulties of "leakages" of benefits to the richer sections of the society. While this may be true, this calls for improvements in the capabilities of programme authorities for appropriate formulation and effective implementation of the schemes. The prevention of large scale "leakages" need not be an insurmountable task. As for the high costs (which will often require subsidization of such programmes or the new agencies running such programmes), the social benefits may outweigh such costs provided the benefits do start reaching the target groups in a fairly equitable manner.[32]

The implementation of land reforms constitute another major element of structural changes in the new development strategy. Land reforms are not a new idea but have not been effectively carried out in most countries. Land ceilings need to be set at realistic levels - above the economically viable size but not at too high a level - so that a significant proportion of land can be deemed to be "surplus" and can be acquired and redistributed to the landless labourers. The latter should be encouraged to grow more food crops. These persons ought to be provided with all necessary modern inputs and relevant market information to make the land reforms highly successful. In countries where sizeable redistribution of the ownership of land is not feasible on political grounds, urgent tenancy reforms need to be carried out.[33] These relate mainly to the security of the tenure and fixation of rents for the cultivator so that the increasing surpluses are not passed on to the rentier class of landowners. The legal process in practice should effectively favour the tenant cultivator.

/Last

31/ Ibid.

32/ John Mellor has also justified the incurring of such costs. He has in fact gone to the extent of propounding that multiple agencies be allowed to service the small and marginal farmers for supply of farm inputs. The cause of equity in unequal rural structures according to Mellor requires ensuring ample supply or even oversupply of key inputs for the currently disadvantaged group of small and marginal farmers. Cf. Mellor, "Rural Poverty and Agrarian Reform", op.cit.

33/ Cf. Mellor, op.cit.

Last but not the least important element of organizational change relates to the need for the improvement of the capacity of the governments, especially the bureaucracy at all levels, for more careful formulation and implementation of the programmes of rural development. Such improvements would be possible only through sufficient decentralization of decision making powers at the local level. The drawing up and implementation of the programmes of rural development must involve the local people and make maximum use of local resources. Development administrators should change their attitudes in favour of working with and helping the uplift of the persons belonging to the weaker sections of the rural society. A workable management information system must be built up and perfected over time. The progress of various schemes for the benefit of the poor people must be continuously monitored and periodically shared with the actual and potential beneficiaries and appropriate changes should be quickly made after consulting such beneficiaries so as to enhance the utility of the development programmes to them. The governments must effectively co-ordinate the various schemes of rural development being implemented by various governmental agencies so that their collective benefits are maximized and reach a large majority of the poor people. This will essentially involve improving the capabilities of the programme agencies for identification, formulation, monitoring and ex-post evaluation of projects.

2. Complementary economic policies

The above elements of the development strategy focus on the innovative institution of new type of co-operatives of small and marginal farmers (and of persons belonging to other weaker sections of rural society) and aim at involving these persons in the participative management of rural development programmes so that these can be adapted to the needs and aspirations of such persons. However, several complementary economic technological and managerial policies working primarily through the market mechanism will also have to be simultaneously adopted (or strengthened if already in operation) in the development strategies to bring momentum in the process of change. Some of these are described below:

a. Improving existing cultivation practices and reducing post-harvest losses

Wherever inefficiencies exist in the present processes of cultivation at the farm level and scope exists for increasing the yields without incurring additional (or much additional) investment, these should be explored first. Similarly, the degree of post-harvest losses in storage, processing, transport and delivery which are known to be sizeable should also be reduced. The availabilities of food in the market place can thus be augmented within the framework of given technologies and with minimum additional investment.

b. Improving input delivery system

The system of delivery of modern inputs, such as seeds and fertilizers needs to be streamlined so that these inputs reach the farmers in adequate quantities, with unadulterated quality, at reasonable prices (including commissions of intermediaries) and well in time. The time dimension is very important for agricultural operations. The availability of rural credit (for short, medium and long term) requirements needs to be broad-based by focussing on the needs of the small and marginal farmers and other weaker sections of the society.

c. Improved output marketing practices

Marketing has often been found to the main deficiency from which the small and marginal farmers suffer and do not realize the highest possible market price for their output. Improvements in transportation, communication, banking and other logistical facilities and the sale of output through organized and regulated markets would be called for. (The same will be true for increasing the incomes of rural artisans making handicrafts, etc.). There is an urgent need to establish a marketing information system and arrange for speedy dissemination of relevant information at low costs to all potential users.

d. Production incentives through appropriate price and incomes policies

The major impetus to increased production at the farm level would come from incentives provided by appropriate price and incomes policies. The scope for these economic tools have not yet been fully exploited in some of the countries being studied. As pointed out earlier, there are several distortions operating in the factor markets as well as product markets

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which constrain the growth of output especially of small farmers and bias investment towards capital-intensive techniques. These distortions need to be removed. The terms of trade between agricultural and industrial products should be monitored and corrective actions taken to ensure that "agricultural producers are not disadvantaged".[34/] While the interests of consumers may be given due importance, public policy must ensure that substantial increases in agricultural output do not lead to such a degree of reduction of prices that the incomes of the farmers (or concerned group of farmers of a particular crop) do not fall. Action would also be required in reorienting certain foreign trade and exchange rate policies which create distortions mentioned earlier.

e. Development of appropriate technologies and dissemination

A major policy instrument for promoting agricultural growth would be the development of suitable agricultural technologies. While modern agricultural technologies are often capital-intensive (especially irrigation) and their use needs to be encouraged to the extent possible, resource constraints (in terms of investment) would require the development of more appropriate (labour-intensive) technologies which would enhance productivity per acre of land (the most scarce factor) by using more of the relatively abundant factor available in the country-side, namely, labour. Shigeru Ishikawa's recent study undertaken for the Asian Regional Team for Employment Promotion revealed that in the case of rice, the labour input per unit of output on relatively small sized farms has been many more times in Japan and China than in a number of South Asian countries including India.[35/] This has provoked the ARTEP to sponsor exploratory studies of labour absorption in Indian agriculture. Three such studies were undertaken by P.K. Bardhan, by A. Vaidyanathan and jointly by Y. Alagh, G.S. Bhalla and A. Bhaduri which are now available in published form.[36/] Some of these studies have highlighted the differences in conditions prevailing in India versus countries like Japan and China for rice production.

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34/ Rural Asia: Challenge and Opportunity, op.cit., p.21.

35/ Shigeru Ishikawa, Labour Absorption in Asian Agriculture, Asian Regional Programme for Employment Promotion, International Labour Organization, Bangkok, 1978.

36/ P.K. Bardhan et al., Labour Absorption in Indian Agriculture: Some Exploratory Investigations, Asian Regional Programme for Employment Promotion, International Labour Organization, Bangkok, 1978.

Ishikawa's study has stimulated enquiries into the scope for increasing labour-intensity of production of agricultural crops especially in some of the "food deficit" countries of the ESCAP region being covered in this study. Scientists and technicians have been asked to work on designing and testing more labour-intensive technologies for production of various crops suitable for adoption on the farms of Asian countries. Such experiments have already been tried in the Philippines and have shown promise for commercial success. Lorenzo Jose's rice farm in the Philippines has received attention as he successfully adopted more labour-intensive Japanese rice farming techniques since 1966.[37/] More recently, the International Rice Research Institute has undertaken the "rice garden" experiment in its test fields and demonstrated the viability of achieving higher yields with much higher labour input per unit of rice output on small sized plots each measuring 250 square meters.[38/] Such experiments have demonstrated relatively low requirements of capital investment per unit of output. More Research and Development work obviously needs to be undertaken in "food deficit" countries of the ESCAP region for identifying yield increasing avenues for various agricultural products through more appropriate technology.

Another important area for technological research for the countries covered in this study relate to the yield increasing technologies for rainfed areas. Yet another area of high priority research in these countries relates to paying adequate attention to the well known harmful environmental effects of spread of modern technology to areas where land has been put to agricultural use by cutting down forests. There is need to improve the system of land use planning by integrating forestry management with the agricultural land use management.

Equally important is the task of adaptive research which can efficiently transfer the results achieved on model experimental farms to average field conditions in these countries. This would require improvements in the information and communication system by using modern media wherever feasible.

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37/ Luis C. Ranit and J.D. Drillon Jr., "Lorenzo P. Jose Rice Farm", Teaching and Research Forum, Agricultural Development Council.

38/ Information through personal discussions with Robert W. Herdt at the International Rice Research Institute, Los Banos (Philippines), February 1979.

f. Creation of new on-farm and off-farm employment opportunities[39/]

The scope for the creation of additional jobs within the agriculture sector, however, has clear limits, especially in the short and medium run coinciding say with the period of national five year Plans). It is patently obvious that in order to make effective dent into the massive problem of ameliorating rural poverty among the food deficit countries of this region, careful planning will be required for a simultaneous, and perhaps more intensive, effort at creating additional jobs in the non-cropping activities. These include, public works programmes for strengthening the rural infrastructure, and increasing the output of related activities like livestock, dairying poultry, fishery, house building and related activities and services. Programmes like "Food for Work" adopted in some of the Asian countries hold promise of generating more employment and higher incentive for increasing food output (and also, output of basic non-food goods).

Among the off-farm employment opportunities, special importance has to be given to the programmes of rural industrialization which use more of labour and local natural resources such as handicrafts. Those programmes would have to be based on small scale units using more labour-intensive technologies. Adequate protection and encouragement will have to be given to such units even if the cost of production is higher (within reasonable limits) than that of similar products manufactured in the large scale sector. Since industrial and commercial entrepreneurship is lacking in the rural areas and markets for most of the products of small units are located nearer to towns, rural industrialization programmes should first be located in smaller towns with proximity to the villages as well as to bigger towns so that minimum investment has to be made in developing the infrastructure required. As the infrastructure get developed in villages, these activities can spread there. The development of rural industries would require the availability of industrial extension services, including low-cost management consultancy services for providing complete package of advisory services from the stage of identification of opportunities to the inception of the unit and finally to the stage of running the unit satisfactorily with reasonable growth and profitability). A special cadre of trained rural industrial managers based on local talent would have to be created for meeting the personnel requirements of the newly established units.

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39/ Most of the points made in this sub-section have been very persuasively made in the Second Asian Agricultural Survey published by the Asian Development Bank under the title, "Rural Asia: Challenge and Opportunity" (cited earlier).

8. Increasing agricultural exports

And last but not the least, agricultural growth can be stimulated and agricultural incomes increased (or at least stabilized) and also greater employment opportunities generated by planning a long term strategy for increasing production and exportable surplus of some of the agricultural products. This is much more important for a country like Sri Lanka where agricultural (or agricultural or plantation based) exports are the main stay of foreign exchange earnings.

An integrated approach to rural development strategies on the lines enumerated above (which could be extended to other related activities based on needs) in the "food-deficit" countries of the ESCAP region will provide a sound basis for the generation of appropriate Cash nexus between the income and expenditure processes for the masses of people through participative growth. It would also strengthen the growth linkages among the agricultura, industrial and services sectors of these countries. Such an integrated approach alone gives hope for the attainment of the cherished goal of accelerated economic growth with greater social justice accepted by most of these countries.

IV. SOME CONCLUDING OBSERVATIONS

In section III, we have presented only a general framework of the major elements of the new development strategies which would be responsive to the needs of most of the "food deficit" countries of the ESCAP region. The listing of these elements is neither meant to be exhaustive nor necessarily uniformly relevant for each of the countries. A number of elements of the relevant strategies have to be tailor-made to suit the particular conditions and requirements of the country concerned. The illustrative list of the generalized elements of the strategies in Section III makes it abundantly clear that the tasks are complex and very demanding in terms of working out their operational details in a co-ordinated manner, the financial costs of their implementation, and the capacities of the governmental systems to effect orderly institutional changes. Some of the proposed crucial changes in the development strategies require political decisions of far reaching consequences in terms of sharing the powers of governmental decision making with local officials and adversely affecting the power position of the various interest groups in the society. These are undoubtedly tough tasks. But then as V.S. Vyas has aptly commented:" hardly any soft options are left".[40/]

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40/ V.S. Vyas, "Mainsprings of Agricultural Growth in India", op. cit., p. 16.

The nature of some of basic changes required in the development strategies has been clearly recognized by the various bodies of the United Nations since 1975. The ESCAP adopted resolutions in 1976 on the need for evolving integrated programme on rural development in its Thirty-second and Thirty-third sessions and recommended them for adoption by the governments of member countries. The Manila Declaration on Food and Agriculture adopted by the governmental representatives of various countries at the Thirteenth FAO Regional Conference for Asia and the Far East (August 5-13, 1976) accepted the need for small farmer focus of agricultural development programmes. Almost in all countries selected for this study, the national governments have accepted the ideas of initiating integrated rural development programmes with a focus on the needs of the small farmers which are reflected in the official documents of their latest national five year plans. However, not much progress has yet been achieved by these countries on these fronts and the tasks indicated in sections II and III above remain as important at present as earlier. The climate seems to be right for the reorientation (or more effective reorientation) of the development strategies in these countries along the lines recommended in this paper.

/Appendix:

Appendix: STATISTICAL TABLES

Table A-1. Agriculture production indexes
(1969-1971 = 100)

Year	Bangladesh	India	Indonesia	Pakistan	Sri Lanka
1962[a/]	-	91	94	87	91
1966	99	89	99	88	96
1970	102	102	100	101	101
1971	88 (-13.72)	101 (-0.08)	101 (1.0)	100 (-0.09)	99 (-1.08)
1972	88 (0.0)	94 (-6.03)	100 (-0.09)	99 (-1.00)	97 (-2.02)
1973	96 (9.09)	100 (6.39)	106 (6.0)	99 (0.00)	90 (-7.21)
1974	89 (-7.29)	92 (8.00)	109 (2.83)	98 (-1.01)	96 (6.67)
1975	96 (7.87)	101 (9.79)	108 (-0.01)	95 (-3.06)	97 (1.05)
1976	90 (-6.25)	96 (-4.05)	107 (0.02)	95 (0.00)	97 (0.0)
1977	95 (5.56)	98 (2.09)	107 (0.00)	99 (4.21)	103 (6.19)

Source: FAO, Production Year Book, 1977.
Notes: Figures within parenthesis show percentage change over previous year.
a/ Recomputed by us.

Table A-2. Index numbers of food production
(1961-1965 = 100)

Year	Asia	Bangladesh	India	Indonesia	Pakistan	Sri Lanka
1962	-	-	99	103	94	-
1964	104	104	104	104	103	-
1966	106	101	97	108	108	101
1970	123	129	123	129	147	130
1971	125 (1.63)	133 (3.10)	124 (0.82)	133 (3.10)	143 (-2.92)	124 (-4.61)
1972	124 (-0.80)	131 (-1.50)	118 (-4.83)	131 (-1.50)	149 (4.20)	119 (-4.03)
1973	131 (5.65)	143 (9.16)	129 (9.33)	143 (9.16)	156 (4.70)	120 (0.84)
1974	132 (0.77)	152 (6.30)	121 (-6.20)	152 (6.30)	161 (3.21)	141 (17.50)
1975	141 (6.82)	154 (1.32)	137 (13.23)	154 (1.32)	163 (1.25)	141 (0.0)
1976	143 (1.42)	157 (1.95)	137 (0.00)	157 (1.95)	172 (5.53)	138 (-2.22)
1977	148 (3.50)	170 (8.28)	144 (5.11)	161 (2.55)	182 (5.82)	152 (10.15)

Source: FAO, Production Year Book (Various issues).
Note: Figures within parenthesis indicate percentage change over previous year.

/Table A-3.

Table A-3. Imports of cereals as percentage of total domestic production of cereals: Asia[a/]

Year	Asia	Bangladesh	India	Indonesia	Pakistan	Sri Lanka
1962	-	-	-	-	-	-
1963	6.68	-	4.51	0.71	2.37	9.99
1966	10.66	-	9.80	0.13	3.56	30.32
1970	15.74	-	3.69	7.09	-	66.75
1972	9.1	10.69	0.53	6.21	6.61	60.43
1974	11.16	10.21	4.94	7.53	10.18	57.53
1975	9.71	11.97	5.96	9.65	9.49	95.88
1976	9.64	7.71	5.62	9.23	9.03	70.55
1977	10.26	3.27	5.05	11.84	2.50	80.04

Note: a/ Estimated based on FAO data sources. (Yearbooks for Production and Trade, various issues).

Table A-4. Average annual exponential trend rates of growth of imports of all cereals for Asia and selected ESCAP countries for 1962-1963 period a/

(Percentage)

Country/ Group	Trend rate in quantity imported of cereals (Dependent Variable: O_m^c) Form fitted $\log_e O_m^c = \log_e A + b\,t + \log_e u_t$ where t indicates time (1, 2, ...) (Figures within parenthesis indicate t-ratios)	Rate of Growth % per annum	Trend rate in value of imports of cereals (Dependent Variable: V_m^c) Form fitted $\log_e V_m^c = \log_e A' + b't + \log_e u'_t$ (Figures in parenthesis indicate t-ratios)	Rate of Growth % per annum
Asia (FAO definition)	$\log_e O_m^c$ = 11.97 + 0.093 t (154.6) (11.60) R^2 = 0.906	9.3	$\log_e V_m^c$ = 11.00 + 0.240 t (25.92) (5.47) R^2 = 0.681	24.0
Bangladesh	= 9.48 + 0.0081 t (15.96) (0.16) R^2 = 0.03	0.8	= 9.19 + 0.119 t (25.00) (2.00) R^2 = 0.34	11.9
India	= 11.00 - 0.052 t (27.1) (1.23) R^2 = 0.10	-5.2	= 10.47 + 0.019 t (24.18) (0.42) R^2 = 0.012	1.9
Indonesia	= 5.65 + 0.322 t (10.44) (5.75) R^2 = 0.702	32.2	= 5.17 + 0.414 t (8.81) (6.81) R^2 = 0.768	41.4

/Table A-4 (continued)

Table A-4 (continued)

Country/ Group	Trend rate in quantity imported of cereals (Dependent Variable: O_m^c) Form fitted $\log_e O_m^c = \log_e A + b\,t + \log_e u_t$ where t indicates time (1, 2, ...) (Figures within parenthesis indicate t-ratios)	Rate of Growth % per annum	Trend rate in value of imports of cereals (Dependent Variable: V_m^c) Form fitted $\log_e V_m^c = \log_e A' + b't + \log_e u'_t$ (Figures in parenthesis indicate t-ratios)	Rate of Growth % per annum
Pakistan	= 9.26 - 0.029 t (22.65) (0.69) R^2 = 0.032	-2.9	= 8.70 + 0.017 (16.76) (0.32) R^2 = 0.007	1.7
Sri Lanka	= 7.85 + 0.111 t (46.25) (6.35) R^2 = 0.740	11.1	+ 7.10 + 0.203 t (35.75) (9.91) R^2 = 0.875	20.3

Note: a/ Source of data for computations: FAO, Trade Year Book, various issues.

Table A-5.1. Bangladesh: Monthly per capita consumption of items by monthly expenditure levels during 1973-1974 (rural)

(in T.K.)

Monthly household expenditure levels (TK)	Total expenditure (T. Exp.)	Expenditure on food and drink		Expenditure on clothing and foot-wear		Expenditure on rent		Expenditure on fuel and lighting	
		TK	As % of T. Exp.	TK	As % of T. Exp.	TK	As % of T. Exp.	TK	As % of T. Exp.
All groups	84.87	63.42	74.73	4.46	5.26	4.11	4.85	6.85	8.08
< 50	14.90	10.81	72.55	0.26	1.75	1.05	7.05	2.53	16.98
50-99	29.57	20.94	70.82	1.22	4.13	2.12	7.17	4.53	15.32
100-149	37.59	27.49	73.14	1.77	4.71	2.49	6.63	4.68	12.45
150-199	45.47	33.98	74.73	2.07	4.56	2.73	6.01	5.08	11.18
200-249	53.09	40.05	75.44	2.42	4.56	3.01	5.67	5.65	10.65
250-299	58.02	44.18	76.15	2.72	4.69	3.27	5.64	5.68	9.79
300-399	66.31	50.46	76.31	3.31	5.0	3.6	5.43	6.09	9.19
400-499	74.87	56.66	75.68	4.09	5.47	4.05	5.41	6.47	8.65
500-749	87.33	66.41	76.05	4.82	5.52	4.56	5.23	6.81	7.80
750-999	103.9	77.79	74.87	6.19	5.96	4.95	4.77	7.17	6.9
1000-1499	117.93	86.30	73.18	7.63	6.47	5.38	4.57	7.45	6.32
1500-1999	156.57	118.63	75.77	9.0	5.75	6.78	4.33	7.42	4.74
2000 & above	361.64	253.53	70.11	11.95	3.31	6.19	1.72	27.64	7.65

Source: A.K.M. Ghulam Rabbani and Shahalat Hossain, "Rural and Urban Consumption Patterns in Contemporary Bangladesh", Dacca: Bangladesh Bureau of Statistics, May 1978.

/Table A-5.2.

Table A-5.2. Consumer expenditure (Rs.0.00) per person for a period of 30 days by broad groups of items and by monthly per capita expenditure classes - all India: rural

Item	Monthly per capita expenditure class in Rs.								
	0-13	13-15	15-18	18-21	21-24	24-28	28-34	34-43	43-55
Cereals	6.15 (58.18)	7.97 (56.76)	10.21 (60.73)	11.61 (59.02)	13.10 (58.35)	15.18 (58.31)	17.48 (56.42)	20.34 (52.99)	23.81 (49.03)
Food: total	8.72 (82.49)	11.64 (82.90)	14.05 (83.58)	16.42 (83.47)	18.63 (82.98)	21.74 (83.51)	25.78 (83.21)	31.65 (82.46)	39.05 (80.41)
Fuel & light	1.07 (10.12)	1.31 (9.33)	1.42 (8.44)	1.54 (7.82)	1.76 (7.83)	1.91 (7.33)	2.13 (6.87)	2.45 (6.38)	2.87 (5.95)
Clothing	0.03 (0.28)	0.13 (0.92)	0.20 (1.18)	0.21 (1.16)	0.40 (1.78)	0.50 (1.92)	0.69 (2.22)	1.05 (2.73)	2.00 (4.11)
Footwear	-	-	0.01 (0.05)	0.01 (0.05)	0.01 (0.04)	0.02 (0.07)	0.04 (0.12)	0.05 (0.13)	0.12 (0.24)
Non-food: total	1.85 (17.51)	2.40 (17.1)	2.76 (16.41)	3.25 (16.52)	3.82 (17.01)	4.29 (16.48)	5.20 (16.78)	6.73 (17.53)	9.51 (19.58)
Total Consumer Expenditure	10.57 (100.0)	14.04 (100.0)	16.81 (100.0)	19.67 (100.0)	22.45 (100.0)	26.03 (100.0)	30.98 (100.0)	38.38 (100.0)	48.56 (100.0)

/Table A-5.2 (continued)

Table A-5.2. (continued)

Item	Monthly per capita expenditure class in Rs.					
	55-75	75-100	100-150	150-200	200 and above	All class
Cereals	27.50 (43.26)	31.84 (37.32)	33.78 (28.28)	34.63 (20.38)	43.71 (15.35)	23.00 (43.38)
Food: total	48.58 (76.43)	60.82 (71.29)	75.24 (63.0)	89.10 (52.45)	128.55 (45.15)	39.70 (74.89)
Fuel & light	3.46 (5.44)	4.14 (4.85)	5.14 (4.30)	5.97 (3.51)	7.98 (2.80)	2.96 (5.58)
Clothing	4.38 (6.89)	8.02 (9.40)	16.13 (13.50)	24.77 (14.58)	44.88 (15.70)	3.58 (6.75)
Footwear	0.27 (0.42)	0.70 (0.82)	1.24 (1.03)	2.02 (1.18)	3.96 (1.39)	0.26 (0.49)
Non-food: total	14.98 (23.56)	24.49 (28.70)	44.18 (36.99)	80.75 (47.54)	156.14 (54.84)	13.31 (25.10)
Total Consumer Expenditure	63.56 (100.0)	85.31 (100.0)	119.42 (100.0)	169.85 (100.0)	284.69 (100.0)	23.01 (100.0)

Source: NSS, SARVEKSHANA, vol. 1, No. 1, July 1977.

Note: Figures in parenthesis are percentages.

/Table A-5.3.

Table A-5.3. Indonesia: percentage distribution of total monthly expenditure: 1969/70: by monthly per capita expenditure class: rural (Java & outer)

Exp. class Rs./month	Exp. on food as percentage of total expenditure	Cereal and cereal products	Housing and utilities
0-300	83.3	42.5	8.7
301-500	81.3	42.4	9.3
501-750	81.0	42.5	9.0
751-1000	80.7	41.2	8.4
1001-1250	80.1	39.1	8.2
1251-1500	79.7	35.9	7.7
1501-2000	79.0	32.6	7.3
2001-2500	78.2	28.7	7.1
2500-3000	75.0	19.8	6.2

Source: Central Bureau of Statistics as cited in the Asia Development Bank's Country Profile: Indonesia prepared for the Second Asian Agricultural Survey Team.

/Table A-5.4.

Table A-5.4. Pakistan: distribution of monthly expenditure for rural household on major items: 1971/72

Monthly income group	Monthly total expenditure (in Rs)	(Avg) monthly exp. on food		Monthly exp. on cereals as a percentage of exp. on food	Monthly exp. on clothing & foot-wear as % of total exp.	Monthly exp. on rent as % of total exp.	Monthly exp. on fuel & lighting as % of total exp.	Avg. monthly income per household including taxes paid (Rs)	Net savings as % of monthly income
		in Rs	as % of total exp.						
All groups	237.86	137.15	57.66	36.2	11.0	5.7	5.4	234.43	-1.5
Rs. 50	84.33	47.93	56.84	46.0	16.7	5.0	5.6	39.75	-13.0
Rs. 50-99	96.26	57.85	60.10	41.8	11.8	6.5	7.2	81.83	-17.7
Rs. 100-149	138.91	83.25	59.93	40.3	11.6	5.9	6.7	125.41	-10.9
Rs. 150-199	184.73	110.65	59.90	38.9	11.2	5.6	6.1	173.86	-6.3
Rs. 200-249	231.71	137.52	59.35	35.8	11.0	5.3	5.6	223.51	-3.7
Rs. 250-299	273.51	163.11	59.64	35.4	11.3	5.5	5.3	271.74	-0.7
Rs. 300-399	336.59	193.63	57.53	34.2	10.5	5.3	4.8	339.07	0.7
Rs. 400-499	432.31	245.12	56.70	32.3	10.7	4.3	4.6	440.75	1.9
Rs. 500-749	563.41	296.94	52.71	34.7	10.9	4.2	4.0	578.76	2.6
Rs. 750-999	760.25	389.88	51.29	29.2	9.9	9.1	3.9	854.19	11.0
Rs.1000-1499	1064.02	484.65	45.55	28.3	9.9	3.4	3.1	1198.62	11.2
Rs.1500-1999	1321.16	558.50	42.28	32.5	6.6	25.5	3.5	1812.00	25.9
Rs.2000 & above	1842.62	706.81	38.36	23.4	10.3	13.1	3.8	2675.17	31.1

Source: Government of Pakistan, Household Income and Expenditure Survey 1971/72 (Statistical Division, Ministry of Finance, Planning and Development), 1973.

/Table A-5.5.

Table A-5.5. Sri Lanka: average expenditure per spending unit for two months on selected items by major income groups - rural

Income groups	Total expenditure (total exp)	Expenditure on food		Expenditure on cereals		Expenditure on clothing & footwear		Exp. on housing including rent, rates and repairs		Exp. on fuel & lighting		Exp. on clothing		Exp. on footwear	
		Rs.	As % of total exp.	Rs.	As % of exp. on food	Rs.	As % of total exp.	Rs.	As% of total exp.	Rs.	As% of total exp.	Rs.	As% of total exp.	Rs.	As % of total exp.
All groups	324.66	191.29	58.92	46.75	24.44	29.52	9.10	19.42	5.99	15.24	4.70	29.30	9.03	0.22	0.07
0-50	153.52	101.55	66.15	26.51	26.11	6.64	4.33	8.92	5.81	7.14	4.65	6.63	4.32	0.01	0.01
51-100	187.09	124.88	66.75	34.52	27.65	11.23	6.01	10.07	5.39	9.26	4.95	11.21	6.0	0.02	0.01
101-200	224.10	145.50	64.93	39.29	27.01	16.48	7.36	10.67	4.77	10.65	4.76	16.41	7.33	0.07	0.04
201-400	321.61	194.76	60.56	49.28	25.31	31.39	9.76	18.98	5.91	15.55	4.84	31.23	9.71	0.16	0.05
401-800	448.99	254.67	56.72	56.99	22.38	45.90	10.23	28.96	6.45	18.93	4.22	45.47	10.13	0.43	0.10
801-1600	662.13	341.15	51.53	68.98	20.22	67.12	10.14	50.29	7.6	29.11	4.40	66.21	11.00	0.91	0.14
1601-2000	1352.65	561.04	41.48	107.93	19.24	131.80	9.75	80.95	5.99	49.70	3.68	129.69	9.59	2.11	0.16
2001-3000	961.18	423.87	44.10	59.98	14.15	95.29	9.92	58.75	6.12	27.56	2.87	94.73	9.86	0.56	0.06
Over 3000	1834.37	554.12	30.21	71.06	12.83	151.52	8.26	125.94	6.87	76.89	4.20	150.26	8.20	1.26	0.07

Source: Central Bank of Ceylon: Survey of Ceylon's Consumer Finances 1963, Part II, Statistical Tables.

/Table A-6.

Table A-6. Average caloric and protein availability per consumer unit of households by expenditure groups, India, 1971/72

Expenditure Rs per capita per month	Urban			Rural		
	Per cent of households	Calories (per consumer unit per day)	Protein (grams per consumer unit per day	Per cent of households	Calories (per consumer unit per day)	Protein (grams per consumer per day
0-15	0.9	1,228	37	3.9	1,493	46
15-21	3.7	1,582	46	10.5	1,957	60
21-24	3.6	1,821	54	7.1	2,287	69
24-28	6.0	1,970	58	10.2	2,431	73
28-34	10.2	2,130	62	15.2	2,734	82
34-43	14.9	2,343	69	17.7	3,127	93
43-55	15.4	2,622	76	14.4	3,513	105
55-75	16.9	2,872	82	11.5	4,016	121
75-100	11.3	3,190	91	5.2	4,574	139
More than 1,000	17.0	3,750	110	4.2	6,181	182

Source: FAO, World Food Survey, 1977 (table II.1.3).

/Table A-7.1.

Table A-7.1. Bangladesh: Size distribution of total owned land in rural Bangladesh in 1977

Acres	No. of households	% of total	Area owned	% of total	Average Area (acres)
Zero	1,311,570	11.07	-	-	-
0.01-1.00	5,621,303	47.44	1,300,165	9.30	0.24
1.01-2.00	1,946,450	16.43	2,792,855	14.43	1.44
2.01-3.00	1,055,546	8.91	2,551,605	13.18	2.42
3.01-4.00	624,412	5.27	2,153,332	11.13	3.45
4.01-5.00	389,454	3.29	1,741,880	9.00	4.48
5.01-6.00	247,534	2.09	1,334,433	6.90	5.39
6.01-7.00	169,817	1.43	1,102,116	5.69	6.49
7.01-8.00	120,339	1.02	899,196	4.65	7.48
8.01-9.00	82,365	0.69	696,996	3.60	8.47
9.01-10.00	49,589	0.42	476,443	2.46	9.61
10.01-11.00	39,931	0.34	414,482	2.15	10.38
11.01-12.00	34,086	0.29	392,750	2.03	11.53
12.01-13.00	18,408	0.16	328,825	1.18	17.87
13.01-14.00	26,356	0.22	351,372	1.82	13,34
14.01-15.00	15,711	0.13	230,535	1.19	14.68
Over 15	15,790	0.80	2,183,991	11.29	22.80
Total	11,848,658	100.00	19,351,776	100.00	1.64

Source: Bangladesh Bureau of Statistics, Summary Report of the 1977 Land Occupancy Survey of Rural Bangladesh.

/Table A-7.2.

Table A-7.2. Estimated number of households and area owned by different size groups of holdings (all India)

Size group of ownership holdings	No. of households and area owned (in '000)								
	1953-1954			1961-1962					
	No. of house-holds	Area owned (acres)	Average area (acres)	No. of house-holds	Area owned (acres)	Average area (acres)	No. of house-holds	Area owned (acres)	Average area (acres)
Marginal (below 1 acre)	15,360 (31.43)	4,166 (1.36)	0.27	23,579 (36.84)	5,062 (1.59)	0.21	35,640 (43.99)	4,910 (1.58)	0.14
Small (1-4.99)	17,448 (35.71)	45,670 (14.95)	2.62	22,468 (35.11)	58,465 (18.39)	2.60	27,415 (33.84)	71,158 (22.86)	2.60
Medium (5-14.99)	11,145 (22.81)	95,230 (31.18)	8.54	13,002 (20.32)	109,252 (34.52)	8.44	13,564 (16.74)	112,464 (36.13)	8.29
Big (15-49.99)	4,306 (8.81)	106,795 (34.97)	24.80	4,514 (7.05)	109,252 (34.37)	24.20	4,058 (5.01)	96,856 (31.12)	23.87
Large (50 and above)	604 (1.24)	53,580 (17.54)	88.71	437 (0.68)	35,379 (11.13)	80.96	350 (0.43)	25,856 (8.31)	73.87
Total	48,863 (100.00)	305,441 (100.00)	6.25	64,000 (100.00)	317,861 (100.00)	4.97	81,027 (100.00)	31,245 (100.00)	3.84

Source: NSS. No. 36, 8th Round for 1964-1965, NSS No. 144, 17th Round for 1961-1962, and NSS No. 215, 26th Round for 1971-1972, tables on land holdings. As computed by V.S. Vyas in "Some Aspects of Structural Change in Indian Agriculture", Presidential Address to the Indian Society of Agricultural Economics, January 18, 1979, Exhibits, table 1.

/Table A-7.3.

Table A-7.3. Indonesia: Structure of ownership of land holdings, 1963

Size group of ownership holdings HA	Total no. of owners	Area owned	Average area (Ha)	No. of owners as % of total	Area owned as % of total
0.10-0.25	3,467,981	425,550	0.1	30.51	3.93
0.25-0.50	2,445,620	863,187	0.4	21.52	7.96
0.50-0.75	1,605,486	956,450	0.6	14.13	8.82
0.75-1.00	873,643	740,626	0.8	7.69	6.83
1.00-2.00	1,737,692	2,307,881	1.3	15.29	21.29
2.00-5.00	945,646	2,695,842	2.9	8.32	24.86
5.00-10.00	204,926	1,342,534	6.6	1.81	12.38
10.00-15.00	48,424	566,664	11.7	0.43	5.23
15.00-25.00	25,975	474,973	18.3	0.23	4.38
25.00-& Over	11,297	470,894	41.7	0.10	4.35
Indonesia	11,366,690	10,844,601	1.0	100	100

Source: Agricultural Census 1963. (Statistical Yearbook of Indonesia 1975, Central Bureau of Statistics, Indonesia).

Table A-7.4. Pakistan: Structure of private ownership of farms (farm households), 1972

Category (Acres)	Owner households	% of total	Area owned a/	% of total	Average area
All households	1,635,109	100	19,399,988	100	11.87
<1.0	120,629	7.38	58,317	b/	0.49
1.0-2.5	245,771	15.03	386,908	2	1.58
2.5-5.0	291,074	17.81	986,788	5	3.39
5.0-7.5	234,488	14.34	1,338,926	7	5.71
7.5-12.5	282,389	17.27	2,577,350	13	9.13
12.5-25.0	267,113	16.34	4,085,052	21	15.30
25.0-50.0	124,358	7.61	3,516,062	18	25.28
50.0-150.0	58,071	3.56	3,652,479	19	62.90
150.0 & above	11,216	0.69	2,798,106	14	249.48

Source: Government of Pakistan, Agricultural Census of Pakistan 1972.

Notes: a/ Percentage less than 0.5.
b/ The data taken for area owned is the owner farms area.

Table A-7.5.

Table A-7.5. Sri Lanka: Distribution of operational holdings by size according to the land owned by agricultural operators

Size class of the holding (acres)	Number of holdings Total	%	Total area of holdings (acrees)	% Area	Number of operators owning no land	% of total such operators to total operators	Number of operators owning agricultural land besides and area owned	
							Number	% of total such operators
All classes	1,645,260	100.0	3,848,745	100.0	114,996	7.0	811,983	100.0
Less than 1/8	132,008	8.3	7,986	0.2	24,024	18.2	5,401	0.7
1/8 to less than 1/4	151,612	9.2	22,731	0.6	13,237	8.7	10,902	1.4
1/4 to less than 1/2	212,858	12.9	60,274	1.6	14,862	7.0	40,530	5.0
1/2 to less than 1	250,317	15.2	153,568	4.0	15,772	6.3	98,230	12.1
1 to less than 2	317,185	19.2	401,118	10.4	19,222	6.1	179,529	22.1
2 to less than 3	187,064	11.4	423,059	11.0	10,529	5.6	132,104	16.3
3 to less than 4	120,171	7.3	390,712	10.2	5,282	4.4	101,603	12.5
4 to less than 5	78,213	4.8	331,279	8.6	2,992	3.8	68,737	8.5
5 to less than 10	147,933	9.0	934,294	24.3	5,105	3.5	133,808	16.5
10 to less than 15	24,514	1.5	284,108	7.4	1,217	5.0	21,964	2.7
15 to less than 20	8,165	0.5	136,864	3.6	512	6.3	7,248	0.9
20 to less than 25	4,417	0.3	95,942	2.5	490	11.1	3,616	0.5
25 to less than 50	7,071	0.4	235,960	6.1	959	18.9	3,619	0.5
50 and over	3,732	0.2	370,849	9.6	793	21.3	2,692	0.3

Source: Computed from: Sri Lanka, Department of Census and Statistics: Census of Agriculture, 1973, Colombo, 1977.

/Table A-8.

Table A-8. India: Consumer price indexes for agricultural labour (A) and implicit consumption deflator in national accounts (B), 1960-1961 = 100

Year	(A)	(B)
1961-1962	103	104.3
1963-1964[a/]	118	116.5
1964-1965	142	127.1
1965-1966	155	137.6
1966-1967	190	156.1
1967-1968	206	176.5
1968-1969	185	169.8
1970-1971	192	179.8
1973-1974	286	241.0

Source: As cited in Montek S. Ahluwalia, "Rural Poverty in India: 1956-1957 to 1973-1974", World Bank Staff Working Paper No. 279. Price indexes for individual states and for India as a whole relate to the agricultural year July-June and are prepared by the Labour Bureau and reported in the Indian Labour Journal. However, these do not include estimates for some of the states (Tamil Nadu, Uttar Pradesh and Rajasthan) for years preceding 1964-1965. For these states we have used estimates prepared by other researchers. We have used A.V. Jose (1974) as the basic source supplemented by Lal (1976).

Note: a/ Calculated from Indian Labour Journal on assumption that index in July-August 1963 was the same as the average for September-December 1963. Figures for Tamil Nadu and Uttar Pradesh are averages of 1962-1963 and 1964-1965 obtained from Lal (1976).

/Table A-9.

Table A-9. Growth rates of labour force and share of agriculture in selected developing countries of Asia: 1965-1975

Country	Compound growth rate of labour force			Agriculture's share of labour force	
	Total	Agriculture	Non-agriculture[a/]	1965	1975
	(Per cent per annum)			(Per cent)	
Far East[b/]	-	-	-	71	65
Bangladesh	2.8	1.9	(4.9)	73	67
India	1.5	1.4	1.9	73	72
Indonesia	2.1	1.3	3.9	72	67
Pakistan	2.4	1.5	4.5	73	67
Sri Lanka	2.2	1.3	3.2	54	50

Sources: ADB, Asian Agricultural Survey, 1976; Rural Asia: Challenge and Opportunity, April 1976, table I-3.3, p. 52).

Notes: a/ Figures in parenthesis appear to be especially questionable. The "non-agriculture" labour force has been estimated by deducting agricultural labour force from the total labour force. So part of the explanation may be that for some countries the figures for the non-farm labour force contain a substantial number of unemployed workers.

b/ Far East as per FAO definition.

/Table A-10.

Table A-10. Linkage coefficients and rankings: India, Indonesia and Sri Lanka (U = Coefficient of Direct Backward Linkage; W = Coefficient of Direct Forward Linkages; Y = Total Linkage Coefficient; and Z = Coefficient of Total Linkage)

	U		W		Y		Z	
	Coeffi-cient	Rank	Coeffi-cient	Rank	Coeff-cient	Rank	Coeffi-cient	Rank
India (66 sectors) 1973-74								
1. Foodgrains	0.2153	57	0.1333	49	0.7925	56	0.8908	24
2. Other agriculture	0.2295	55	0.4627	26	0.7944	55	2.4297	4
Indonesia (19 sectors) 1971								
1. Paddy	0.2157	17	3.1899	2	1.2168	5	0.6750	18
2. Other staple food-crops	2.3441	4	0.6220	8	0.7923	13	0.9495	10
3. Other agricultural crops	1.3856	5	2.2360	3	1.2582	4	1.0378	8
Sri Lanka (42 sectors) 1965								
1. Tea including processing	0.1402	31	-	38	0.7551	31	0.6073	38
2. Rubber including processing	0.0879	36	0.0125	32	0.7019	36	0.7220	27
3. Coconuts including toddy	0.0706	37	0.5311	15	0.6824	37	1.8722	4
4. Paddy including straw for paper	0.1222	35	0.9274	3	0.7084	35	1.6535	5
5. Other agriculture	0.0388	39	0.0518	28	0.6492	39	0.8413	20

Source: ADB, Rural Asia: Challenge and Opportunity, New York, Praeger, 1977, Appendix I-6.1 (a), (c) and (I).

Notes: For the methodology of computing U, W, Y and Z see next page.

/Formulae

Formulae for computing linkage coefficients

Two methods and four measures are used in this chapter to determine the strength of intersectoral linkages from the input-output studies. The first method considers only the direct inter-industry transactions.

Let $X = \sum_i \sum_j X_{ij}$, an input-output transactions matrix of rank (n x n) where X_{ij} refers to the ith sector's demand for inputs from sector j. Thus the strengthe of the backward linkages in sector j (the jth input supplying sector (j = 1,2...n) is measured by:

$$(1)\quad U = \frac{\sum_i X_{ij}}{X_j} = \frac{\text{total intermediate input of sector j}}{\text{total (gross) output of sector j}}$$

The strength of the forward linkage in sector i (the ith input demanding sector (i = 1,2....n) is measured by:

$$(2)\quad W = \frac{\sum_i X_{ij}}{D_i} = \frac{\text{total intermediate demand for the output of sector i}}{\text{total demand for sector i}}$$

A second method to define the strengths of the linkages considers both the direct and indirect inter-industry flows.

Let $C = (I - A)^{-1}$, a matrix of rank (n x n).

where A = matrix of technical input-output coefficients.

$$(3)\quad Y = \frac{n\sum_i C_{ij}}{\sum_i \sum_j C_{ij}} \quad \text{and} \quad (4)\quad Z = \frac{n\sum_j C_{ij}}{\sum_j \sum_i C_{ij}}$$

The index Y measures the total linkage effect of changing activity levels in sector j on all the other sectors. Z measures the direct and indirect stimulation which the ith sector receives from all the other sectors. Thus Y and Z are not equivalent to the backward and forward linkage coefficients U and W. The former are indexes standardized by the average total linkage effects of all the sectors. The index Y is sometimes called the "power of dispersion" or the "total linkage coefficient". Z is called the "sensitivity of dispersion" or the "coefficient of total linkage receipt". The general framework of input-output analysis is detailed in H. Chenery and P. Clark, Industry Economics, John Wiley and Sons, New York, 1959 and R. Dorfman, P. Samuelson and R. Solow, Linear Programming and Economic Analysis, McGraw-Hill, New York, 1958.

Measures of the internal structure of production, of inter-temporal homogeneity within countries, and of linkages to the foreign sector were examined with rank correlation coefficients. The Kendall Coefficient of Concordance was employed to test a measure of homogeneity of the structure of production across DMCs. These tests are summarized in S. Siegel, Non-parametric Statistics, McGraw-Hill Book Co., New York, 1956, pp. 202-223 and pp. 229-238.

/Table A-11.

Table A-11. Assumed growth rates of GNP per capita and estimated income elasticities for major staples

IFPRI category/ country	Annual per capita GNP growth rate (per cent)		Estimated income elasticity			
			Cereals		Pulses/ ground-nuts	Meat
	High income growth	Low income growth	High income growth	Low income growth		
Asia						
Low income food deficit						
1. Bangladesh	1.5	0.5	0.49	0.50	...	1.17
2. India	1.5	1.1	0.45	0.47	0.50	1.17
3. Indonesia	4.1	3.1	0.39	0.42	0.30	1.17
4. Sri Lanka	2.1	1.6	0.46	0.48	0.15	1.17
Grain exporters						
5. Pakistan	3.4	2.6	0.23	0.25	0.30	1.17

Source: IFPRI, Food Needs of Developing Countries: Projections of Production and Consumption to 1990, December 1977, table 2.1, pp. 147-148.

/Table A-12.

Table A-12. Basic data used in production and consumption projections by country, 1975 and 1990

(Thousand metric tons)

IFPRI Category/ country	1975					1990				
	Production		Consumption			Consumption				
	Actual	Trend	Actual	Trend	110% of energy requirement	Production	At 1975 per capita level	Low income growth	High income growth	110% of energy requirement
Asia										
Low income Food deficit										
1. Bangladesh	12,281	12,000	14,236	13,397	17,993	15,019	20,472	21,373	22,983	27,596
2. India	111,933	108,252	113,343	112,450	136,788	156,137	160,455	173,702	178,016	195,517
3. Indonesia	23,551	23,848	25,678	25,450	28,654	37,138	36,714	43,123	44,794	41,378
4. Sri Lanka	792	1,028	1,996	2,147	2,768	1,683	2,840	3,182	3,278	3,666
Grain exporters										
1. Pakistan	11,849	12,618	12,508	13,144	15,432	27,775	21,071	23,523	24,105	24,752

Source: IFPRI, Food Needs of Developing Countries: Projection of Production and Consumption to 1990. December 1977 (table 19, pp. 129-130).

/Table A-13.

Table A-13. Projections of the total labour force of selected developing countries of Far East in 1985

Country	Total labour force 1985 (000)	Annual rate of growth 1975-1985 a/ (per cent)	New entrants 1975-1985 (000)
Bangladesh	34,935	3.2	9,415
India	238,591	2.2	46,848
Indonesia	57,756	2.7	13,422
Pakistan	28,473	3.2	7,673
Sri Lanka	5,700	2.3	1,177
Asia (total) b/	481,049	2.5	106,221

Sources: ADB, Asian Agricultural Survey, 1976; Rural Asia: Challenges and Opportunities, April 1977, table II-2.5, p. 186).

Notes: a/ From ILO, 1965-1985 Labour Force Projections, Geneva, 1971.
b/ Asia - as defined in the ADB, Asian Agricultural Survey, 1976.

/Table A-14.

Table A-14. India: aggregate consumer demand for selected agricultural commodities, 1971, 1985 and 2000

(million tons)

Commodity	1971[a/]	1985		2000	
		Low	High	Low	High
Rice	38.74	52.40	56.60	68.76	73.98
Wheat	20.85	29.60	33.39	41.04	45.89
Other cereals	24.40	30.93	30.73	37.79	37.53
Total cereals	83.99	112.93	120.72	147.59	157.40
Pulses	10.32	14.83	17.73	20.70	24.70
Total foodgrains	94.31	127.76	138.45	168.29	182.10

Source: National Commission on Agriculture (Government of India), Demand and Supply, vol. III, p. 7.

Note: a/ Base year.

Table A-15. India: estimated production of selected crops, 1985 and 2000

(million tons)

Crops	1985	2000
Rice	61.0	80.0
Wheat	41.0	50.0
Coarse grains	40.0	65.0
Total cereals	142.0	195.0
Pulses	22.0	35.0
Total foodgrains	164.0	230.0

Source: National Commission on Agriculture, Demand and Supply, vol. III, p. 87.

/Table A-16.

Table A-16. Assumptions of the FAO forecasts for "Agriculture: towards 2000" (preliminary) for selected ESCAP countries

Country	FAO group number	Population (million) 1975	At 2000 criteria				IBRD GNP per capita and class, 1975	FAO growth rate of GDP per capita, 1975-2000 (high)
			Calorie S/R ratio (per cent), 1972-1974	Balance of payments deficit as % of imports (goods and services), 1974-1976 (or 1973-1975)	Agricultural exports as % of total exports, 1974-1976 (or 1973-1975)	U.N. MSA country		
Bangladesh	1	73.7	84	63	28	X	90/L	2.96
Pakistan	1	70.6	92	49	31	X	160/L	3.44
Sri Lanka	2	14.0	94	19	71	X	190/L	3.60
India	3	598.1	89	18	36	X	140/L	3.27
Indonesia	3	136.0	94	6	15	-	220/L	6.34

Source: Food and Agriculture Organisation of the United Nations, "Agriculture: Towards 2000" (Project statement as of end-June 1978).

Notes: S/R = ratio of per capita national average calorie supplies (apparent food consumption and resulting calorie intakes) to requirements, 1972-1974 average, from the FAO, Fourth World Food Survey (Rome, 1978).

Group 1: low nutrition countries (calories S/R ratio < 100) with large balance of payments deficits (current account deficit equals to or larger than 30 per cent of total imports of goods and services).

Group 2: low nutrition countries (calorie S/R ratio < 100) with small balance of payments deficits (smaller than 30 per cent) and high dependence on agricultural exports (40 per cent or more of current account earnings come from agricultural exports - excluding exports of forestry and fisheries products).

Group 3: low nutrition countries (calories S/R ratio < 100) with small balance of payments deficits (D < 30 per cent) and low dependence on agricultural exports (less than 40 per cent).

X U.N. MSA country: most seriously affected country (by petroleum price increase) as classified by the United Nations.

IBRD (World Bank)'s estimate of per capita income in United States dollars; L = low-per capita-income-developing country.

/Table A-17.

Table A-17. Pakistan: requirements and availability of wheat projected up to year 2000/01

(in thousand metric tons)

	1977/ 1978	1978/ 1979	1979/ 1980	1980/ 1981	1981/ 1982	1990/ 1991	2000/ 2001
1. Opening stock	457	464	503	-	-	-	-
2. Production[a/]	9,143	8,289	9,652	10,355	11,825	15,023	19,149
3. Deduction for seed, feed and wastage	914	829	965	1,035	1,183	1,502	1,915
4. Imports	821	2,250	1,250	1,000	-	-	-
5. Closing stock	464	503	447	-	-	-	-
6. Net availability	9,043	9,671	9,993	10,320	10,642	13,521	17,234
7. Population (million)	75.62	77.86	80.16	82.79	84.76	104.76	129.59
8. Per capita consumption (kg/annum)	119.59	124.21	124.66	125.11	125.56	129.07	132.99

Source: Government of Pakistan, Planning Department (supplied on special request).

Note: The above projections are based on the following assumptions:

	1977/78	1982/83	2000/01
(i) Population growth rate (annual)	2.9 %	2.4 %	2.0 %
(ii) Income elasticity for demand	0.36	0.30	0.30

a/ A one-year lag has been assumed between production and consumption.

/Table A-18.

Table A-18. Pakistan: requirements and availability of rice up to year 2000/01

(in thousand metric tons)

	1977/ 1978	1978/ 1979	1979/ 1980	1980/ 1981	1981/ 1982	1990/ 1991	2000/ 2001
1. Opening stock	472	474	600	-	-	-	-
2. Production	2,950	3,077	3,103	3,165	3,272	4,204	5,412
3. Deduction for seed, feed and wastage	177	185	186	190	196	252	325
4. Exports	810	850	886	918	949	1,219	1,569
5. Closing stock	474	600	645	-	-	-	-
6. Net availability	1,961	1,916	1,986	2,057	2,127	2,733	3,518
7. Population (million)	75.62	77.86	80.16	82.49	84.76	104.76	129.59
8. Per capita availability:							
(i) kg/annum	25.93	24.61	24.77	24.94	25.10	26.09	27.17
(ii) g/day	71.04	67.42	67.86	68.33	68.77	71.48	74.38

Source: Government of Pakistan, Planning Department (supplied on special request).

Note: This table is based on the following assumptions:

	1977/78	1990/91	2000/01
(i) population growth rate	2.9 %	2.4 %	2.0 %
(ii) income elasticity of demand	0.66	0.40	0.40